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# **Final Basic Assessment Report for the proposed development of the Hlomendlini Sports Facility in Mandeni, KwaZulu Natal**

Report Prepared for

**Mandeni Local Municipality**



Report Number 559426

Report Prepared by

 **srk** consulting

February 2022

# **Final Basic Assessment Report for the proposed development of the Hlomendlini Sports Facility in Mandeni, KwaZulu Natal**

## **Mandeni Local Municipality**

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**NOTE: FOR EASE OF REFERENCE AMENDMENTS TO THE  
DRAFT BASIC ASSESSMENT REPORT ARE IN BLUE TEXT,  
UNDERLINED AND ITALICISED**

## Executive Summary

### a) Introduction

The Site covers an area of approximately 3.4 hectares and it is envisaged that the project will include the construction of a proposed soccer field, grandstands, ablutions and changerooms, septic tank, soakaway, irrigation system, and a combi court, and then at a later stage, a future proposed track field, practise field, futsal court, and parking area.

### b) Listed Activities

The following activities in Listing Notice No. 1 (GNR 327) of the 2014 Environmental Impact Assessment (EIA) Regulations (as amended in 2017) are included in the application for Environmental Authorisation (EA):

Activity 12: *“The development of ii) infrastructure or structures with a physical footprint of 100m<sup>2</sup> or more; where such development occurs a) within a watercourse.”*

Activity 19: *“The infilling or depositing of any material of more than 10m<sup>3</sup> into, or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles or rock of more than 10m<sup>3</sup> from a watercourse”.*

Activity 27: *“The clearance of an area of 1 hectare or more, but less than 20 hectares of indigenous vegetation, except where such clearance of indigenous vegetation is required for-*

*(i) the undertaking of a linear activity; or*

*(ii) maintenance purposes undertaken in accordance with a maintenance management plan.”.*

All triggered activities fall under Listing Notice 1, which requires a Basic Assessment (BA) to be undertaken. No activities have been identified under Listing Notice 2, and therefore a full EIA is not required for this project.

### c) Project Description

The Mandeni Municipality are proposing the formalisation of the Hlomendlini Sports Facility. The main objectives of the proposed project are to give the surrounding communities access to quality sporting facilities and promote community participation in sporting activities. Municipal Infrastructure Grant (MIG) funds have been allocated to the development and construction of the proposed project.

The proposed development will include construction of the following infrastructure (refer to Figure 1-1):

- A soccer field.
- Open stands.
- Ablutions and changerooms.
- Conservancy tank with a 110mm diameter sewer line from the ablution facilities to the Conservancy tank.
- Water line linking into an existing water meter located offsite.
- A combi court.
- The entire site will be enclosed with a clear view/beta fence with one pedestrian gate and associated guard house, and one service gate entrance / exit.

## d) Specialist Studies

The following specialist studies were undertaken [to inform the BA process](#):

- Freshwater Ecological Assessment.
- Hydropedological Opinion.
- Terrestrial Ecological Impact Statement.
- Geotechnical Investigation.
- Traffic Impact Assessment.

These studies were undertaken by respective specialists and a summary of the studies is provided below.

### 1) Freshwater Ecological Assessment

Based on the findings of the wetland assessment and the results of the risk assessment, it is the opinion of the freshwater ecologist that the proposed project poses a Moderate risk to the integrity of the wetlands within the study area, predominantly due to the infilling of the valley head seep wetland associated with the proposed main soccer field and terrace to create a flat platform for the proposed project. This activity will result in habitat fragmentation and the loss of 0.089 ha of wetland habitat in the valley head seep wetland. It is considered imperative that all mitigation measures as provided in Section 13.1 are strictly adhered to, to minimise the impacts associated with the proposed project.

The following additional mitigation measures are considered imperative for the proposed project:

- If the proposed activities are undertaken during the drier winter months, impacts to the hydrological and geomorphological regimes of the wetlands can be managed.
- Heavy earthworks within the wetlands, particularly for the construction of the proposed main soccer field and terrace within portions of the valley head seep wetland, and concrete works must be carefully controlled, and major terracing should be avoided.
- All footprint areas must immediately be revegetated after the construction activities are completed. This will ensure fast recovery of the wetlands post construction activities.
- It is strongly recommended that the proponent makes provision for a stormwater management plan to service the proposed project. Careful planning of the stormwater management plan that will ensure that stormwater is released in an attenuated manner outside of the wetlands, is imperative to ensure the hydraulic regime of the receiving wetlands is retained.
- Small-scale rehabilitation, including revegetation with indigenous wetland vegetation and control of [Alien Invasive Plant](#) (AIP) vegetation is strongly recommended for the valley head seep wetland specifically, and the [channelled valley bottom](#) (CVB) wetland in general. The long-term impact of rehabilitation activities is considered positive since this will ensure that the ecological service provision of the wetlands is maintained and where feasible, improved.

### 2) Hydropedological Opinion

The construction of the sport field is not anticipated to cause a significant loss of hillslope processes driving the adjacent wetlands on both the local and catchment to the nature of development as well as the absence of hydropedologically important soils associated with the study area. This is with specific mention to the area where the proposed development is to occur and the portion of the sport field encroaching on the valley head seep wetland.

### 3) Terrestrial Ecological Impact Statement

Following the desktop and site assessment it is expected that the impacts on the receiving environment resulting from the proposed activities are anticipated to be low, provided they are suitably managed and that all mitigation measures as per the freshwater report (SAS 220143 – included in Section 13.3) are implemented. Furthermore, it is recommended that as part of the development all AIP species are properly controlled and that a landscaping and revegetation plan be developed for the surrounding and disturbed areas.

#### 4) Traffic Impact Assessment

The purpose of the proposed project is to provide well equipped sporting facilities and equipment for the community members to utilise. The development will not be utilised for large matches or contests that will bring about severe traffic volumes. Moreover, the area surrounding the proposed development is predominantly residential in nature and is classified as a low vehicle ownership area; the majority of the community members who are most likely to utilise the facility will either walk to the development or travel by public transport. The TIA supports the development, provided the recommendations measures stipulated in Section 13.4 are implemented.

#### 5) Geotechnical Assessment

The intrusive geotechnical investigation comprised the excavation of four test pits, twenty Drop Cone Penetrometer (DCP) tests, two percolation tests and laboratory testing of samples retrieved from test pits. Based on the results from the test pits and DCPs, the soils underlying the study area generally have a medium dense consistency, having an E Modulus value ranging from 10 to 30 MPa.

The colluvial and residual soils may be used as bulk fill. Soft excavation in terms of SANS 1200D is likely to be encountered from surface to approximately 1.6 m below existing ground level. Intermediate becoming hard rock excavation is likely to be encountered at depths greater than 1.6 m. The results of two percolation tests undertaken on site, indicate an average application of effluent to subsoil infiltration areas of 35 litres per m<sup>2</sup> can be expected from the underlying subsoil material encountered on site.

The grandstand and ablution facilities should be founded on competent tillite bedrock at depths ranging from 1.0 m to 1.6 m below existing ground level. Where the remaining proposed structures are to be founded on colluvial soils and residual tillite, they are considered Site Class S1/S2 and the foundation design as described above should be adhered to.

Geotechnical constraints affecting, but not limiting development within the study area to any significant degree, include areas requiring removal of boulders, moderate compressible nature of the soils overlying the tillite bedrock, low lying areas affected by flooding, low lying areas with a perched water table, areas of intermediate soil erodibility and areas of difficult excavation conditions (bedrock <1.5 mbgl).

### e) **Impact Identification and Assessment**

Based on the results of the specialist investigations, the key potential impacts relate to freshwater ecology.

There are four key ecological risks on the wetlands that were assessed, namely:

- Loss of wetland habitat and ecological structure resulting in impacts to biota.
- Changes to the socio-cultural and service provision.
- Impacts on the hydrology and sediment balance of the wetlands.
- Proliferation of alien and invasive plant species.

The assessment of these impacts, with proposed mitigation measures to ameliorate these, is provided in [the report](#). The activities associated with the construction and operational phases of the proposed project, which include site preparation, vegetation clearing and excavation and levelling of the platforms for the construction of the proposed project and associated stormwater management, pose a Moderate risk to the overall integrity of the wetlands. The majority of the impacts are considered fully reversible, except those associated with loss of wetland vegetation of the valley head seep wetland that will be traversed by the proposed main Sports Facility and terrace resulting in 0.089 ha of wetland habitat loss. As such, an offset investigation was undertaken to ascertain the functional and conservation habitat hectare equivalents (hae) that must be conserved by the proponent to account for the residual wetland loss. It is recommended that the proponent makes provision for small-scale rehabilitation of the wetlands, particularly the valley head seep wetland which will be directly impacted by the proposed project. This is especially applicable to the removal of alien and invasive plants and the revegetation of the affected areas. These rehabilitation recommendations should be read in conjunction with the rehabilitation measures following the offset

considerations as presented in Section 13.1.10 to improve the functionality and ecological integrity of the identified target wetlands.

Indirect impacts may arise from potential water quality concerns and increased sediment loads entering the wetlands through the stormwater channels. It is recommended that the proponent makes provision for a stormwater management plan to service the proposed project. Careful planning of the stormwater management plan that will ensure that stormwater is released in an attenuated manner outside of the wetlands, is imperative to ensure the hydraulic regime of the receiving wetlands is retained.

#### **f) Environmental Impact Statement**

Although SRK is not an elected entity mandated to make decisions on behalf of society, we hereby provide a qualified opinion. In this regard, SRK is of the opinion that this Draft BA Report, Environmental Management Programme (EMPr) and the attached specialist reports comply with the relevant guidelines and contain all the information required in terms of GN 326 to enable EDTEA to take a decision.

The fundamental decision is whether to allow development that brings economic and operational benefits. In this case, identified potential negative impacts arising from the proposed project can be managed to remain within acceptable environmental limits so long as measures set out in the EMPr are implemented.

***SRK believes that this report and the specialist input confirmed that Mandeni Municipality's preferred option is acceptable.***

***The EMPr stipulates the mitigation measures identified that will mitigate the potential impacts identified to within acceptable limits.***

***In conclusion, SRK is of the opinion that the application, as it is currently articulated in this BA Report, should be approved.***

***This statement is conditional on implementation of the mitigation measures stipulated in the EMPr.***

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## Disclaimer

The opinions expressed in this Report have been based on the information supplied to SRK Consulting (South Africa) (Pty) Ltd (SRK) by Mandeni Local Municipality (Mandeni Municipality). The opinions in this Report are provided in response to a specific request from Mandeni Municipality to do so. SRK has exercised all due care in reviewing the supplied information. Whilst SRK has compared key supplied data with expected values, the accuracy of the results and conclusions from the review are entirely reliant on the accuracy and completeness of the supplied data. SRK does not accept responsibility for any errors or omissions in the supplied information and does not accept any consequential liability arising from commercial decisions or actions resulting from them. Opinions presented in this report apply to the site conditions and features as they existed at the time of SRK's investigations, and those reasonably foreseeable. These opinions do not necessarily apply to conditions and features that may arise after the date of this Report, about which SRK had no prior knowledge nor had the opportunity to evaluate.

## List of Abbreviations

AIP	Alien Invasive Plant
BA	Basic Assessment
BAR	Basic Assessment Report
BAS	Best Attainable State
BID	Background Information Document
CA	Competent Authority
CBD	Central Business District
CoGTA	Department of Co-operative Governance and Traditional Affairs
CVB	Channelled Valley Bottom
DFFE	Department of Fisheries, Forestry and the Environment
DWS	Department of Water and Sanitation
EA	Environmental Authorisation
EAP	Environmental Assessment Practitioner
ECA	Environmental Conservation Act, 1989 (Act No. 73 of 1989)
EDTEA	Department of Economic Development, Tourism and Environmental Affairs
EIA	Environmental Impact Assessment
EIS	Ecological Importance and Sensitivity
EMPr	Environmental Management Programme
EPWP	Expanded Public Works Programme
Hae	Hectare Equivalents
I&APs	Interested and Affected Parties
km	kilometres
MIG	Municipal Infrastructure Grant
NEMA	National Environmental Management Act, 1998 (Act No. 107 of 1998)
NEMBA	National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004)
NEMWA	National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008)
NWA	National Water Act, 1998 (Act No.36 of 1998)
SuDS	Sustainable Drainage System
SRK	SRK Consulting (South Africa) (Pty) Ltd
PPP	Public Participation Process
REC	Recommended Ecological Category
RMA	Recommended Management Objectives
WMS	Water Management System
ZoR	Zone of Regulation

# 1 Introduction

The Mandeni Local Municipality (Mandeni Municipality) owns an approximately 3.4 hectare site situated in a residential area South-West of Padianager and Tugela in Mandeni, KwaZulu Natal. The site currently acts as an informal Sports Facility in the community of Hlomendlini. The Mandeni Municipality is proposing to formalize the Hlomendlini Sports Facility through a project which is envisaged to include the following (Figure 1-1):

- The demolition of:
  - An existing building; and
  - Existing concrete block
- The construction of:
  - A soccer field.
  - Open stands.
  - Ablutions and changerooms.
  - Conservancy tank with a 110mm diameter sewer line from the ablution facilities to the conservancy tank.
  - Water line linking into an existing water meter located offsite.
  - An irrigation water line for watering of the field.
  - A combi court.
  - The entire site will be enclosed with a clear view/beta fence with one pedestrian gate, a guard house, and one service gate entrance / exit.

In terms of the 2014 Environmental Impact Assessment (EIA) Regulations (as amended in 2017) promulgated under the National Environmental Management Act (No. 107 of 1998) (NEMA), the proposed activity is subject to a Basic Assessment (BA) process (Refer to Section 7.2). Mandeni Municipality is applying to the Competent Authority (CA), the KwaZulu-Natal Department of Economic Development, Tourism and Environmental Affairs (EDTEA), for Environmental Authorisation (EA). SRK Consulting South Africa (Pty) Ltd. (SRK) has been appointed by Mandeni Municipality to act as the independent Environmental Assessment Practitioner (EAP) for the BA process.

A Basic Assessment Report (BAR), this report, [has been](#) compiled as part of the BA process. The purpose of the BAR is to provide a concise analysis of the potential environmental impacts of the proposed project, including comments and issues raised by Interested and Affected Parties (I&APs). Refer to Figure 1-1 for a brief overview of the BA Process.

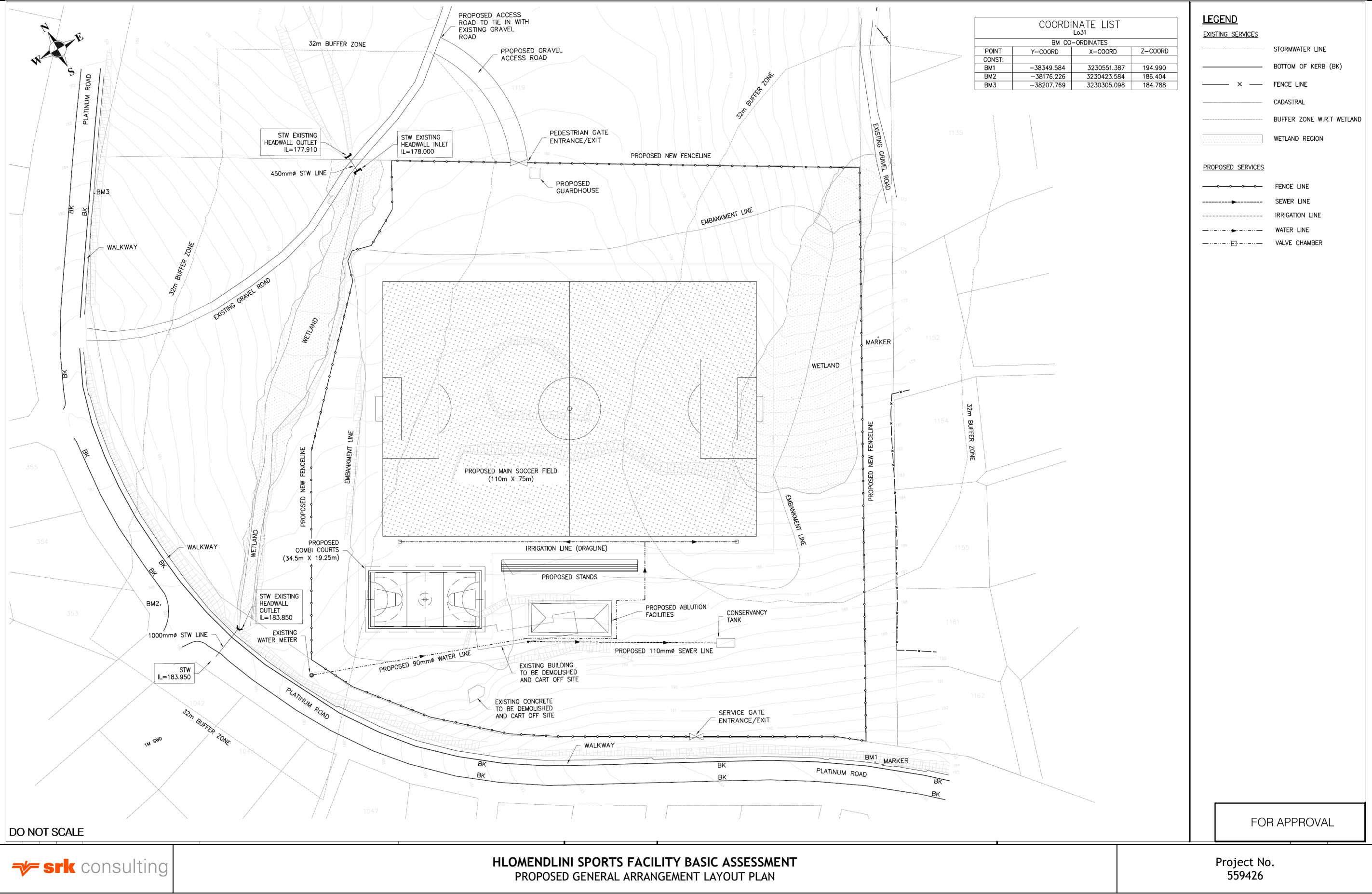
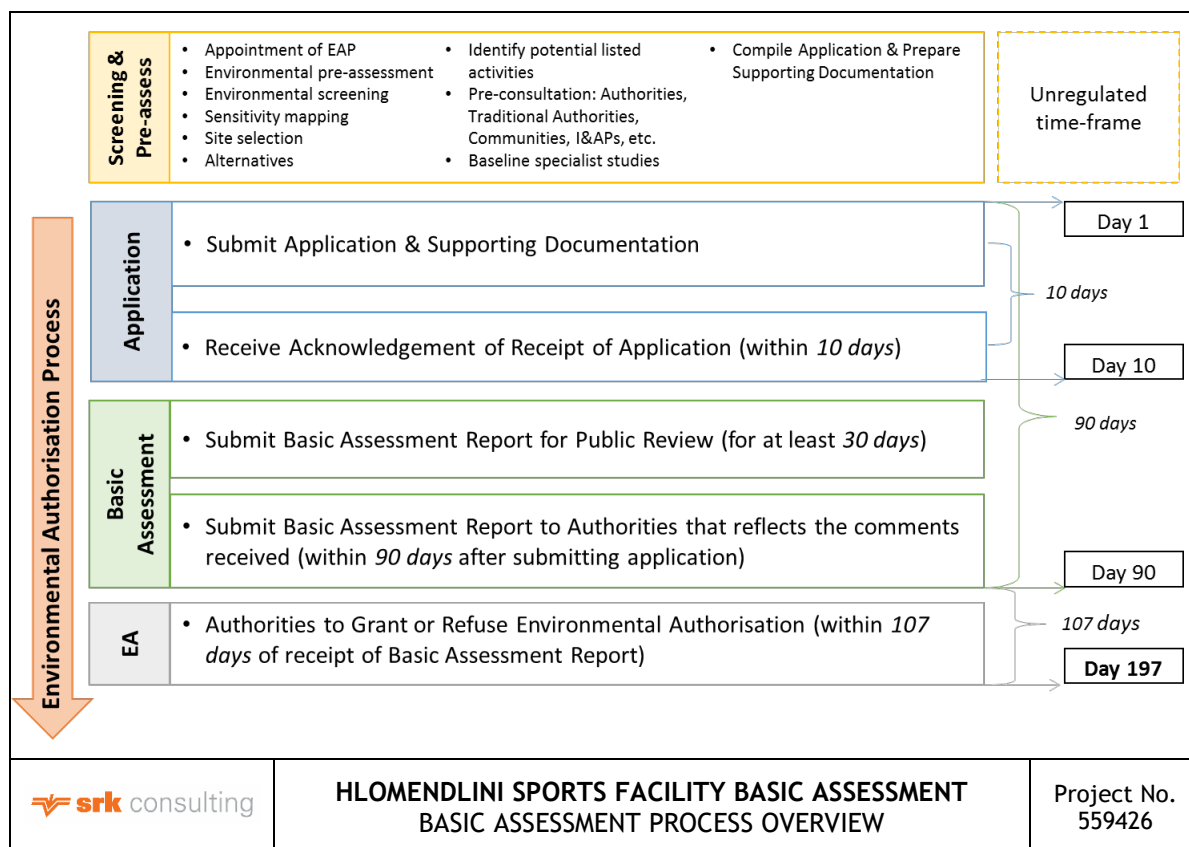


Figure 1-1: Proposed general arrangement layout plan for the preferred alternative





**Figure 1-2: Overview of the Basic Assessment Process**

## 1.1 Content of the BA report

Section 3 of Appendix 1 of the 2014 EIA Regulations (as amended in 2017) prescribe the required content of a BAR. These requirements and the sections of this BAR in which they are addressed, are summarised in Table 1-1.

GN 326: Appendix 1	Content Requirement	Section Reference
3(1)(a)	A basic assessment report must contain the information that is necessary for the competent authority to consider and come to a decision on the application, and must include details of— (i) the EAP who prepared the report; and (ii) the expertise of the EAP, including a curriculum vitae.	Chapter 2; Appendix A and B
3(1)(b)	The location of the activity, including: (i) the 21-digit Surveyor General code of each cadastral land parcel; (ii) where available, the physical address and farm name; (iii) where the required information in items (i) and (ii) is not available, the coordinates of the boundary of the property.	Chapter 3
3(1)(c)	a plan which locates the proposed activity or activities applied for as well as associated structures and infrastructure at an appropriate scale; or, if it is— (i) a linear activity, a description and coordinates of the corridor in which the proposed activity or activities is to be undertaken; or (ii) on land where the property has not been defined, the coordinates within which the activity is to be undertaken;	Chapter 3 and Figures 5-2, 5-4 and 5-5
3(1)(d)	a description of the scope of the proposed activity, including— (i) all listed and specified activities triggered and being applied for; and (ii) a description of the activities to be undertaken including associated structures and infrastructure;	Table 7-1 and Chapter 5



GN 326: Appendix 1	Content Requirement	Section Reference
3(1)(e)	A description of the policy and legislative context within which the development is proposed including— (i) an identification of all legislation, policies, plans, guidelines, spatial tools, municipal development planning frameworks, and instruments that are applicable to this activity and have been considered in the preparation of the report; (ii) how the proposed activity complies with and responds to the legislation and policy context, plans, guidelines, tools frameworks, and instruments;	Chapter 7
3(1)( f)	A motivation for the need and desirability for the proposed development including the need and desirability of the activity in the context of the preferred location;	Chapter 6
3(1)(g)	A motivation for the preferred site, activity and technology alternative;	Chapter 8
3(1)(h)	A full description of the process followed to reach the proposed preferred alternative within the site, including— (i) details of all the alternatives considered;	Chapter 8
	(ii) details of the public participation process undertaken in terms of regulation 41 of the EIA Regulations, including copies of the supporting documents and inputs;	Chapter 9 & Appendix D
	(iii) a summary of the issues raised by interested and affected parties, and an indication of the manner in which the issues were incorporated, or the reasons for not including them;	Chapter 9
	(iv) the environmental attributes associated with the alternatives focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects;	Chapter 4
	(v) the impacts and risks identified for each alternative, including the nature, significance, consequence, extent, duration and probability of the impacts, including the degree to which these impacts— (aa) can be reversed; (bb) may cause irreplaceable loss of resources; and (cc) can be avoided, managed or mitigated;	Chapter 13
	(vi) the methodology used in determining and ranking the nature, significance, consequences, extent, duration and probability of potential environmental impacts and risks associated with the alternatives;	Chapter 2
	(vii) positive and negative impacts that the proposed activity and alternatives will have on the environment and on the community that may be affected focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects;	Chapter 13
	(viii) the possible mitigation measures that could be applied and level of residual risk;	Chapter 10 and 13
	(ix) the outcome of the site selection matrix;	Section 7
	(x) if no alternatives, including alternative locations for the activity were investigated, the motivation for not considering such; and	
	(xi) a concluding statement indicating the preferred alternatives, including preferred location of the activity;	Chapter 8 Section 8.7
3(1)(i)	A full description of the process undertaken to identify, assess and rank the impacts the activity will impose on the preferred location through the life of the activity, including— (i) a description of all environmental issues and risks that were identified during the environmental impact assessment process; (ii) an assessment of the significance of each issue and risk and an indication of the extent to which the issue and risk could be avoided or addressed by the adoption of mitigation measures;	Chapter 13

GN 326: Appendix 1	Content Requirement	Section Reference
3(1)(j)	An assessment of each identified potentially significant impact and risk, including— (i) cumulative impacts; (ii) the nature, significance and consequences of the impact and risk; (iii) the extent and duration of the impact and risk; (iv) the probability of the impact and risk occurring; (v) the degree to which the impact and risk can be reversed; (vi) the degree to which the impact and risk may cause irreplaceable loss of resources; and (vii) the degree to which the impact and risk can be avoided, managed or mitigated;	Chapter 3
3(1)(k)	Where applicable, a summary of the findings and impact management measures identified in any specialist report complying with Appendix 6 to these Regulations and an indication as to how these findings and recommendations have been included in the final report;	Chapters 10 and 13
3(1)(l)	An environmental impact statement which contains— (i) a summary of the key findings of the environmental impact assessment; (ii) a map at an appropriate scale which superimposes the proposed activity and its associated structures and infrastructure on the environmental sensitivities of the preferred site indicating any areas that should be avoided, including buffers; (iii) a summary of the positive and negative impacts and risks of the proposed activity and identified alternatives;	Chapter 15
3(1)(m)	Based on the assessment, and where applicable, impact management measures from specialist reports, the recording of the proposed impact management outcomes for the development for inclusion in the Environmental Management Programme (EMPr);	Chapter 13 and Appendix <a href="#">E</a>
3(1)(n)	Any aspects which were conditional to the findings of the assessment either by the EAP or specialist which are to be included as conditions of authorisation;	Chapter 15
3(1)(o)	A description of any assumptions, uncertainties, and gaps in knowledge which relate to the assessment and mitigation measures proposed;	Chapter 6
3(1)(p)	A reasoned opinion as to whether the proposed activity should or should not be authorised, and if the opinion is that it should be authorised, any conditions that should be made in respect of that authorisation;	Chapter 15
3(1)(q)	Where the proposed activity does not include operational aspects, the period for which the environmental authorisation is required, the date on which the activity will be concluded, and the post construction monitoring requirements finalised;	N/A
3(1)(r)	An undertaking under oath or affirmation by the EAP in relation to— (i) the correctness of the information provided in the reports; (ii) the inclusion of comments and inputs from stakeholders and I&APs; (iii) the inclusion of inputs and recommendations from the specialist reports where relevant; and (iv) any information provided by the EAP to interested and affected parties and any responses by the EAP to comments or inputs made by interested and affected parties	Appendix A
3(1)(s)	Where applicable, details of any financial provision for the rehabilitation, closure, and ongoing post decommissioning management of negative environmental impacts;	N/A
3(1)(t)	Any specific information that may be required by the competent authority; and	N/A
3(1)(u)	Any other matters required in terms of section 24(4)(a) and (b) of the Act.	N/A

## 2 Environmental Assessment Practitioner

SRK Group Consulting Practices employs approximately 1400 professional staff operating from forty-eight (48) established offices on 6 continents. SRK offers expertise in a wide range of environmental and engineering disciplines. SRK's Durban Environmental Department has a distinguished track record of managing large environmental and engineering projects and has been practicing in KwaZulu-Natal since 1990. SRK has rigorous quality assurance standards and is ISO 9001 accredited.

The qualifications and experience of the EAPs responsible for this project, Mrs. Tamaryn Hale, Ms. Kirsten King and Mr. Siphelele Mkhize, are provided in Table 2-1

Refer to **Appendix A** for the EAP Declaration of Interest and **Appendix B** for the curriculum vitae of the EAPs, Mr. Siphelele Mkhize; Mrs. Tamaryn Hale and Ms. Kirsten King. Table 2-1 provides the summarised details of the EAPs.

**Table 2-1: Details of the EAP**

Name	Qualifications	Years of experience
Tamaryn Hale Pr.Sci.Nat, Reg. EAP (EAPASA)	BSc (Hons), Environmental Sciences, BSc, Biological Sciences	13 Years
Kirsten King Reg. EAP (EAPASA)	B.Soc.Sci. (Hons), Environmental Science	23 Years
Siphelele Mkhize Cand. EAP (EAPASA)	BSc, (Hons), Geography BA, Environmental Management	5 Years

## 3 Project Location

The proposed project site is located in the Mandeni Municipality, within the KwaZulu-Natal Province. The proposed site is in the semi-rural area of Hlomendlini, which is approximately 4.5km south of the Mandeni central business district (CBD), approximately 3 km north-west of the Harold Johnson Nature Reserve and 2.5 km west of the R102. The predominant land use in Hlomendlini is residential supported by ancillary facilities such as schools, spaza shops and a clinic. The project site is bounded by the secondary road, Platinum Road, to the east, west and south, and Newark Primary School to the north. There are several informal businesses surrounding the site. The Hlomendlini Clinic is approximately 440 m to the north of the proposed project.

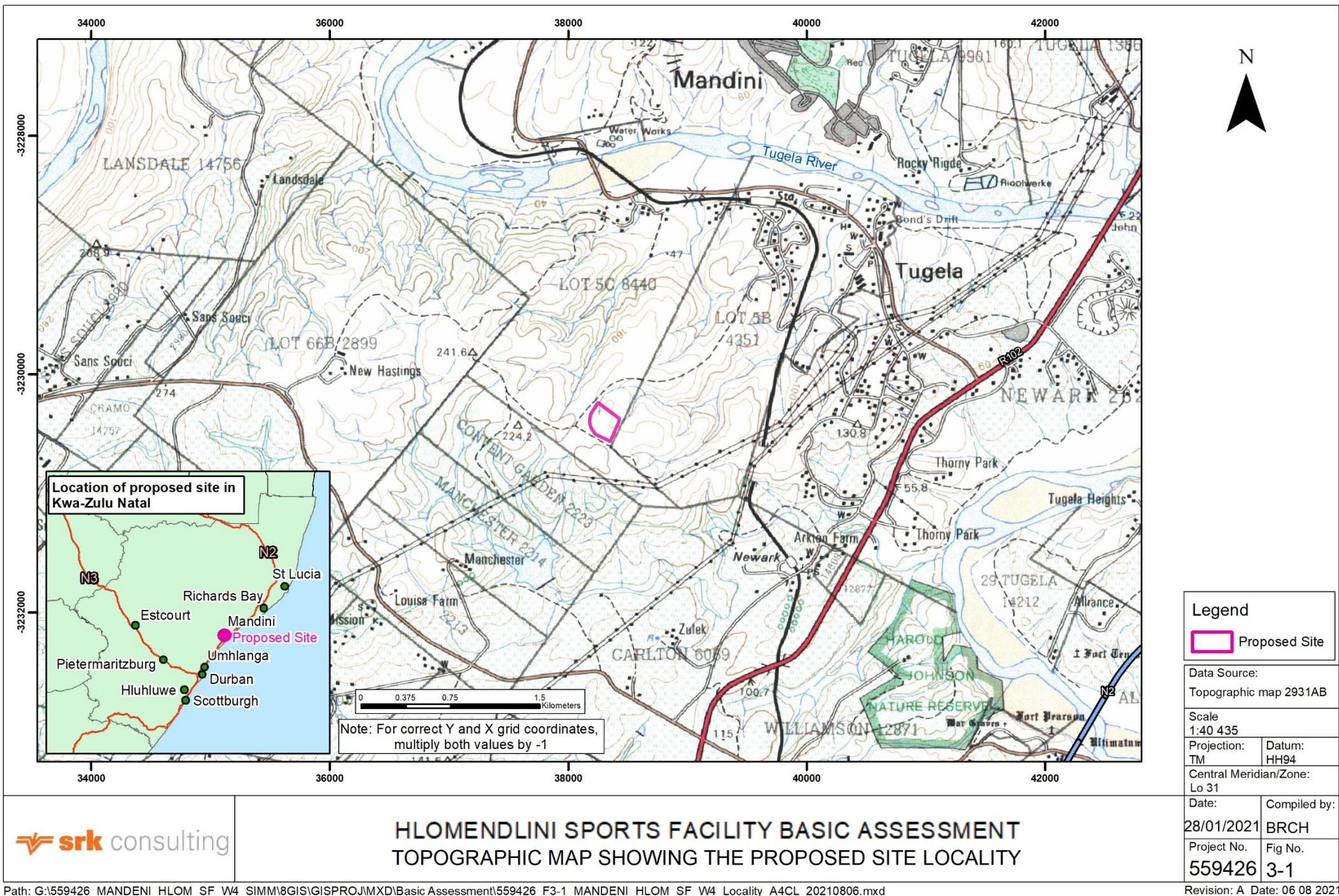
The general locality map showing the outline of the proposed development area on the 1:50 000 scale topographic map and aerial photograph are provided in Figure 3-1 and Figure 3-2 respectively.

The area is mainly serviced by public transport, however, private vehicles are also utilized. Traffic volumes in the project area are extremely low.

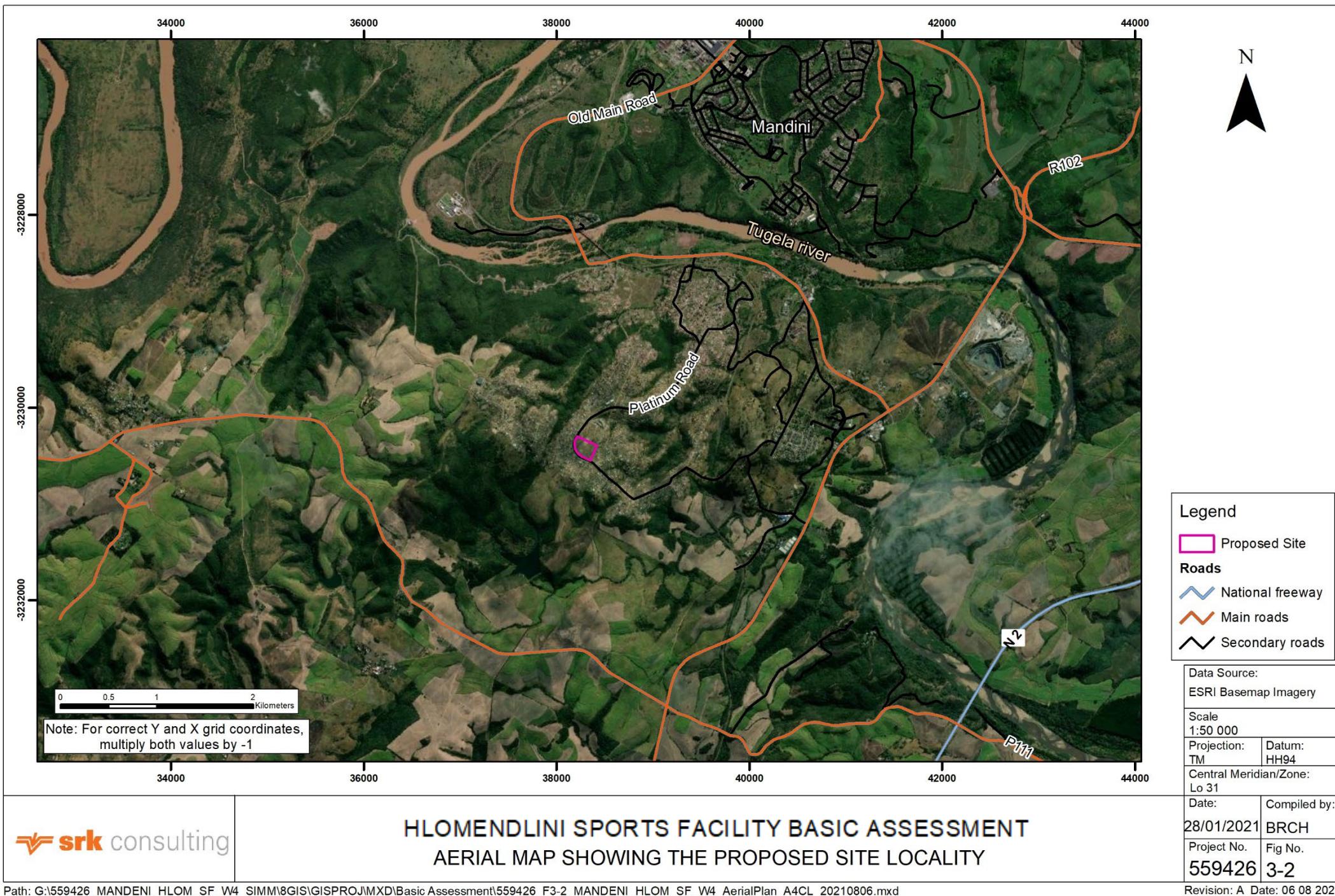
**Table 3-1: Property description**

Property description	SG 21-digit code	Centre co-ordinate of property
Erf 1118 of the Farm Padianager	N0FU02460000111800000	29° 11' 24.84" S 31° 23' 37.52" E









## 4 Baseline Environment

This section has been informed by the following specialist investigations:

- *Freshwater Ecological Assessment as Part of the Environmental Assessment and Authorisation and Water Use Licence Authorisation Processes for the Proposed Hlomendlini Sports Field in Mandeni, KwaZulu-Natal Province.* (SAS/SRK 230321, August 2021). Refer to **Appendix C-1**.
- *Hydropedological Opinion Report for proposed Hlomendlini Sports Field and associated infrastructure in Mandeni, Kwazulu-Natal Province.* (SAS/SRK 230321, March 2021). Refer to **Appendix C-2**.
- *Terrestrial Ecological Impact Statement as part of the Basic Assessment Process for the Proposed Hlomendlini Sports Field and Associated Infrastructure in Mandeni, KwaZulu-Natal Province,* undertaken by SAS (dated August 2021). Refer to **Appendix C-3**.
- *Traffic Impact Assessment for The Proposed Sportfields Complex in Hlomendlini, Mandeni.* (NSA1262, February 2021). Refer to **Appendix C-5**.
- *Mandeni Hlomendlini Sports Field Project – Geotechnical Investigation Report,* undertaken by SRK Consulting (dated March 2021). Refer to **Appendix C-4**.

### 4.1 Site Description

The site is zoned Active Open Space, covers an area of approximately 3.4 ha and a portion of the site is currently used as a soccer field by the local community. There is a partially constructed building towards the southern boundary of the site. According to the municipality the building was constructed in 2010, however, construction was not completed.

The site lies approximately 125m from a Critical Biodiversity Area (CBA). Refer to Plate 4-1, Plate 4-2 and Plate 4-3.

Moderate topographic variations occur from the south to the north of the site (194 mamsl to 179 mamsl). Gentle topographic variations occur from the east to the west of the site (182 mamsl to 187 mamsl).

Hlomendlini can be described as a rural area where unemployment is high. Infrastructure in the area, such as roads are lacking maintenance and require urgent repairs. Access to the area is via a single lane bridge from the P415.

The site falls within the KwaZulu-Natal Coastal Belt Thornveld vegetation type, within the Indian Ocean Coastal Belt biome.





**Plate 4-1: Photograph along the southern boundary of the site, looking north-west showing the partially built structure in the foreground (orange arrow) and the local community utilising the site as a soccer field in the background (green arrow) (June 2020)**



**Plate 4-2: Photograph along the southern boundary of the site, looking north-east showing the type of vegetation found across the site, the school in the background (blue arrow) (June 2020)**



**Plate 4-3: Photograph along the northern boundary of the site, looking south/south-west (June 2020)**

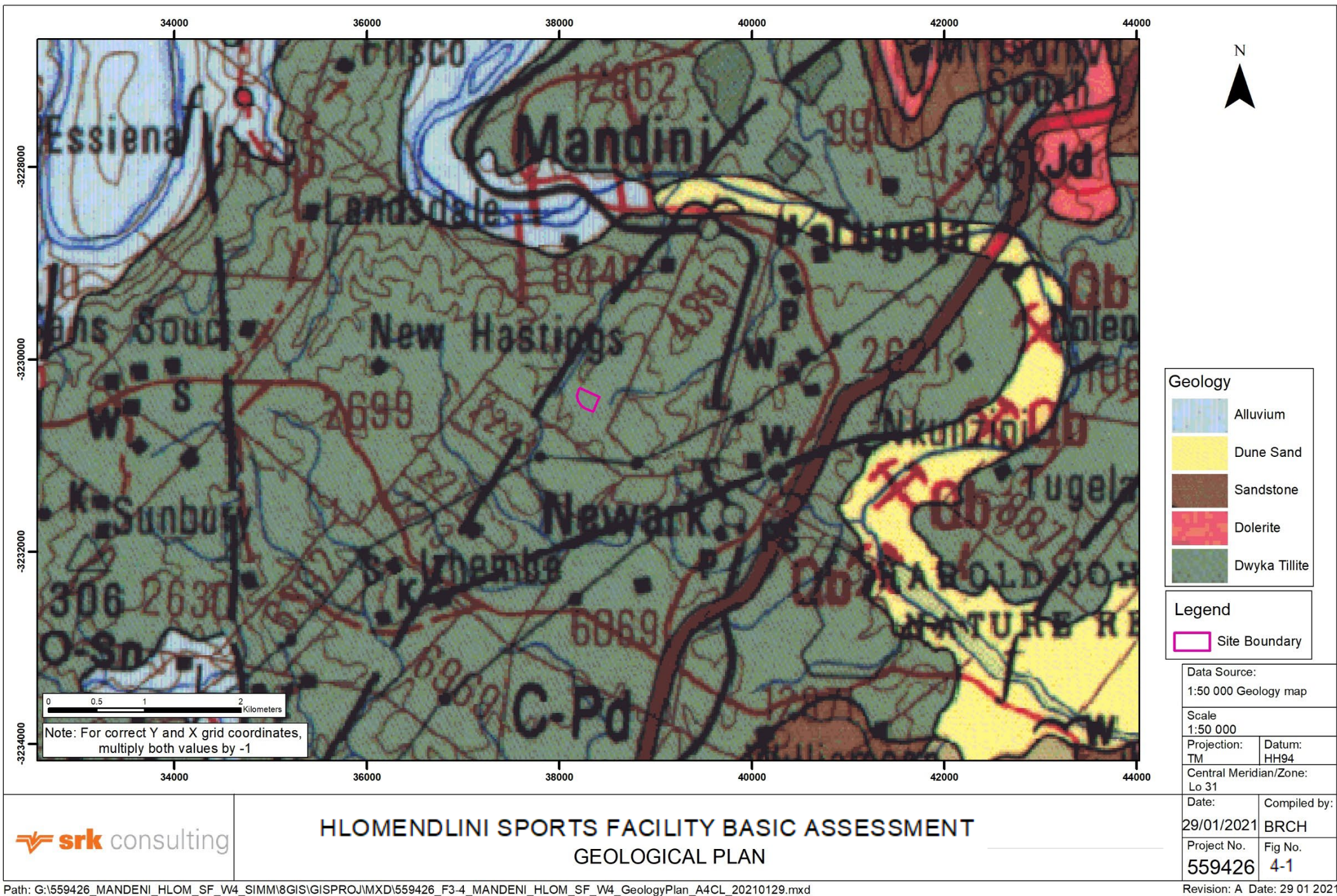
## 4.2 Geology

Based on the 1: 250 000 scale 2930 Durban Geological Map, the general area has a cover of tillite from the Dwyka Group, which forms part of the Karoo Supergroup. Quaternary-aged alluvium is seen to the north of the site (refer to Figure 4-1).

A variety of lithological facies types have been recognised in the Dwyka Group, which is considered to have been deposited in a marine basin. The Dwyka Group shows distinct lithological differences over the basin, which led to the recognition of northern and southern facies. The northern valley/inlet facies belong to the Mbizane Formation, and is characterised by rapid thickness changes, a highly variable lithology, and a low massive diamictite and high mudrock content. The southern platform facies constitute the Elandsvlei Formation and is characterised by a progressive increase in thickness towards the south, a fairly uniform lithology, and a high massive diamictite and low mudrock content (Johnson *et al.*, 2006).

The intrusive Karoo dolerite suite occurs as an interconnected network of dykes, sills and saucer-shaped sheets (Duncan & Marsh, 2006). No intrusions are shown to be present within the proposed development area. Colluvium, un-engineered fill, and residual tillite soils were intersected in test pits (SRK, March 2021).

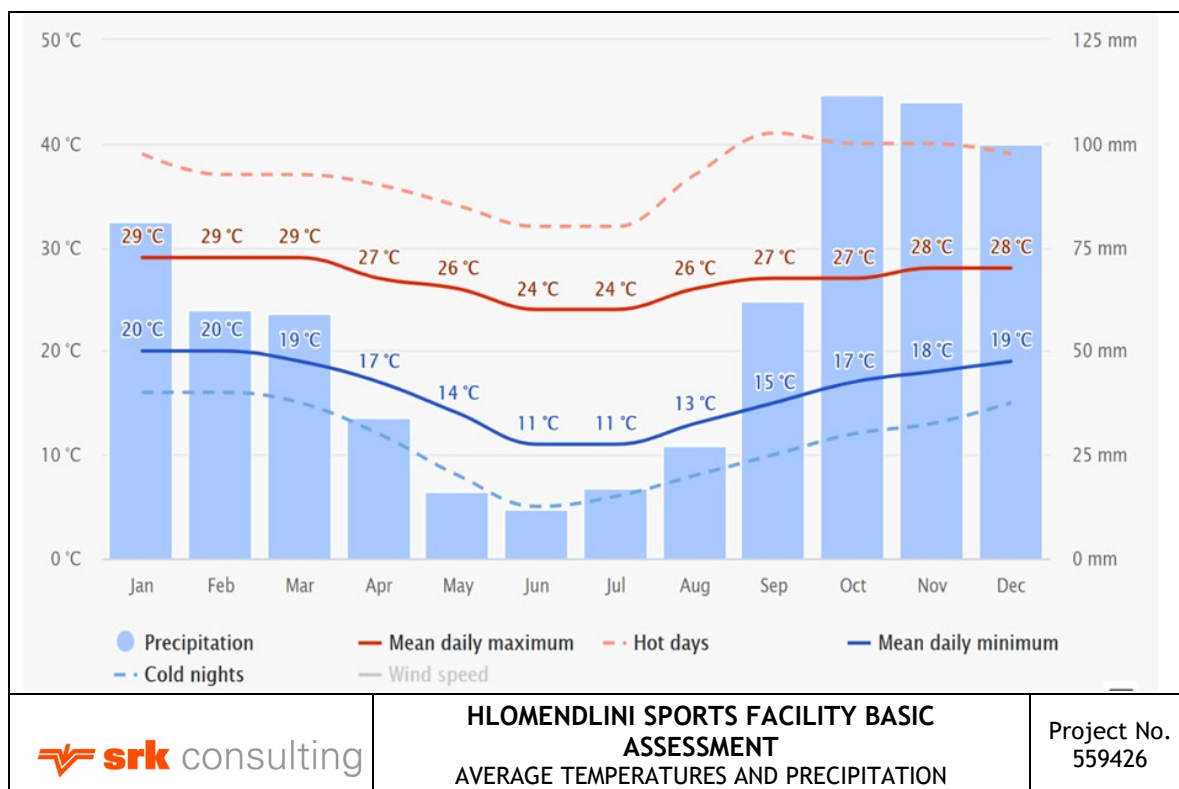




### 4.3 Climate

The climate of Mandeni can be classified as warm and temperate. The Mandeni area receives an average annual rainfall of 690 mm, the bulk of which occurs during the summer months. The average midday temperatures range from 11°C in June to 29°C in January.

Figure 4-2 shows the mean monthly minimum and maximum temperatures as well as the mean monthly average precipitation. It should be noted however, that the values shown are based on 30 years of hourly weather model simulations and the simulated weather data have a spatial resolution of approximately 30km.



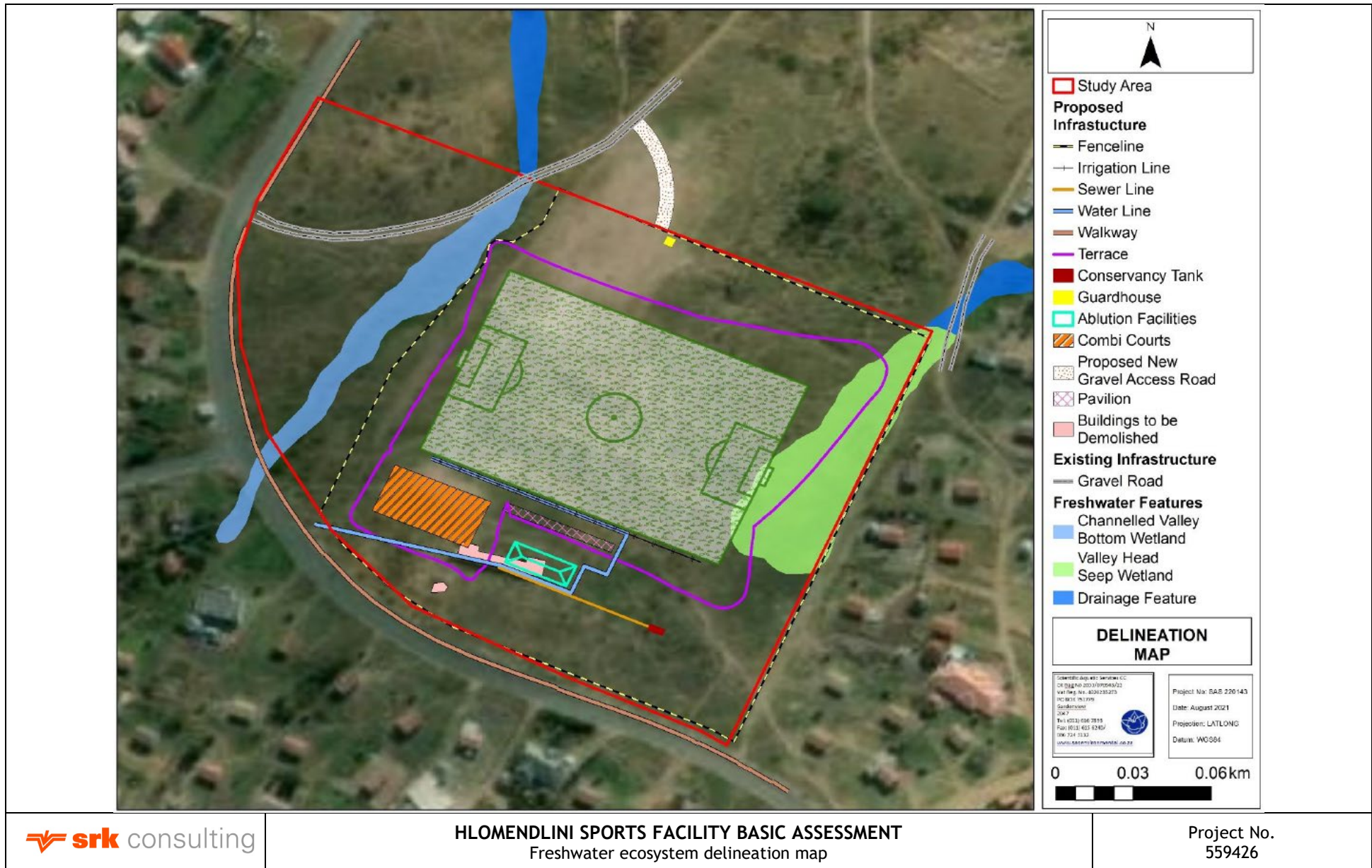
**Figure 4-2: Average temperatures and precipitation for Mandeni, KwaZulu-Natal**  
([www.meteoblue.com](http://www.meteoblue.com))

### 4.4 Wetlands

The site is located within the V50D quaternary catchment within the Tugela catchment in the North Eastern Coastal Belt Ecoregion. The site is in a sub-quaternary catchment currently not considered important in terms of fish or freshwater ecological conservation (National Freshwater Ecosystem Priority Area (NFEPA), 2011).

Two wetlands have been identified and delineated within the boundaries of the site, a modified channelled valley bottom (CVB) wetland and a valley head seep wetland (Figure 4-3). Both systems are connected to drainage features that were identified in the larger investigation area.





**Figure 4-3: Wetland delineation in the study area in relation to the proposed development (Source: SAS/SRK 230321, March 2021)**

#### 4.4.1 Channelled Valley Bottom Wetland

The CVB wetland is within the western portion of the site, occurring less than 10 m from the proposed project.

The CVB wetland has been impacted by various anthropogenic activities in the surrounding catchment, including the surrounding housing development (Plate 4-1) and associated road infrastructure that have altered the pattern, flow and timing of stormwater in the surrounding landscape. This has resulted in increased flood peaks in the CVB wetland, significantly impacting the hydrology. Consequently, runoff from the adjacent residential areas and roads has potentially augmented the surface water input into this system such that the system receives increased volumes of water, leading to the development of prominent wetness indicators and hydrophilic plants. Infilling and modifications to the active channel, particularly from the road and culvert crossing within the wetland (Plate 4-2), further impact the hydrological and geomorphological integrity of the system. The CVB wetland is invaded by Alien and Invasive Plant (AIP) species, contributing to the overall disturbance to the system. Based on the above, the Present Ecological State (PES) of the CVB is therefore Category E (Seriously Modified).



**Plate 4-4: CVB wetland receives additional water input from the surrounding housing development**



**Plate 4-5: Existing culvert crossing within the CVB wetland confining flow**

The Ecological Importance and Sensitivity (EIS) is characterized as Moderate. The CVB wetland is considered to be ecologically important and sensitive on a landscape scale, due to the protection status of wetlands within a peri-urban setting. Furthermore, the vegetation type associated with the CVB wetland (according to NFEPA, 2011) is considered to be critically endangered and moderately protected, although no remnants were identified at the time of the site visit, and it is considered unlikely that any species that are representative of this vegetation type will be found due to the large-scale surrounding impacts. The hydro-functional importance of the system was considered to be moderate due to important services such as streamflow regulation and hydrological connectivity while the direct human benefits are considered to be low as a result of the low dependency of people in the area on the wetland for providing direct benefits such as water supply and harvestable resources.

In terms of ecoservice provision, the CVB wetland is considered of moderately high importance for stream flow regulation, and of intermediate importance for flood attenuation, sediment trapping, phosphate, nitrate and toxicant assimilation and erosion control. This is largely as a result of the high surface roughness provided by the vegetation within the CVB wetland. The biodiversity maintenance is considered moderately low, mainly due to the significant anthropogenic impacts and the low buffer zone associated with the system. The assessed reach of the CVB wetland is not considered of value for tourism and recreation.



The CVB has the following wetland characteristics:

- **Hydraulic regime:** The hydrological functioning of the CVB wetland is considered to be seriously modified as a result of surrounding housing development and road infrastructure which have resulted in increased impervious/hardened surfaces in the surrounds, contributing to increased stormwater input to the CVB wetland altering the pattern, timing, and flow of water within the CVB wetland. The presence of culverts along the reach of the CVB wetland further impact the hydrology of the wetland through confining flow and increased the risk of incision.
- **Water quality:** Due to stormwater inputs and catchment land use changes, the surface water quality of the CVB wetland is expected to be impaired.
- **Geomorphology and sediment balance:** The geomorphology of the CVB wetland can be considered moderately modified due to increased sediment loads as a result of run-off from the gravel roads and sediment deposition at culvert outlets. No significant erosion was noted within the CVB wetland due to the surface roughness provided by the vegetation present in the CVB wetland.
- **Habitat and biota:** The CVB wetland is hydrologically connected to other freshwater ecosystems (to other drainage features feeding into the Thukela River) and may thus be considered as an important corridor for faunal movement, breeding and foraging. The vegetation of the CVB wetland is impacted by cattle grazing and extensive AIP proliferation.

#### 4.4.2 Valley Head Seep Wetland

The valley head seep wetland (Plate 4-3) is within the eastern portion of the site, of which the western portion of this wetland will be traversed by the proposed project.

The valley head seep wetland has been impacted by land use changes in the surrounding catchment, including the surrounding housing development and associated road infrastructure which have resulted in the increase of impervious surfaces in the surrounding landscape, altering the pattern, flow and timing of flood peaks into the wetland, thus impacting the hydrology regime of the wetland. Signs of sediment deposition were also noted (Plate 4-4), albeit limited, but having a marked effect on the geomorphology and vegetation of the affected areas. Based on the above, the PES is Category C (Moderately Modified).



**Plate 4-6: Overview of the valley head seep wetland within the surrounding landscape**



**Plate 4-7: Signs of sediment deposition noted within the valley head seep wetland**

The EIS is characterized as Moderate. The valley head seep wetland is considered to be ecologically important and sensitive on a landscape scale, due to the protection status of wetland within a peri-urban setting. Furthermore, the vegetation type associated with the valley head seep wetland (according to NFEPA, 2011) is considered to be critically endangered and moderately protected, although no remnants were identified at the time of the site visit, and it is considered unlikely that any species that are representative of this vegetation type will be found due to the large-scale surrounding

impacts. The hydro-functional importance of the system is considered to be moderate while the direct human benefits are considered to be low.

In terms of ecoservice provision, the valley head seep wetland is considered of moderately high importance for sediment trapping, phosphate, nitrate and toxicant assimilation and erosion control, largely as a result of the high surface roughness provided by the vegetation within the valley head seep wetland; the sediment trapping capability is evidenced by signs of sediment deposition within the wetland. The valley head seep wetland is of intermediate importance for flood attenuation, stream flow regulation and cultivated food. The biodiversity maintenance is considered moderately low, mainly due to the anthropogenic impacts and the low buffer zone associated with the system. The assessed reach of the valley head seep wetland is not considered of value for tourism and recreation.

The valley head seep has the following wetland characteristics:

- **Hydraulic regime:** The hydrological functioning of the valley head seep wetland is considered moderately modified largely as a result of surrounding housing development and road infrastructure contributing to increased stormwater input to the valley head seep wetland altering the pattern, timing, and flow of water within the wetland.
- **Water quality:** Due to stormwater inputs and catchment land use changes, the surface water quality of the valley head seep wetland is expected to be impaired.
- **Geomorphology and sediment balance:** The geomorphology of the valley head seep wetland can be considered moderately modified due to increased sediment loads as a result of run-off from the gravel roads resulting in sediment deposition to the wetland. No significant erosion was noted within the wetland due to the surface roughness provided by the vegetation present in the valley head seep wetland.
- **Habitat and biota:** The wetland habitat on site forms part of a network of open spaces and natural corridors which provide support for local fauna and flora within a transformed landscape. The high surface roughness offered by the vegetation with the valley head seep wetland assists in sediment trapping and erosion control.

#### 4.4.3 Hydropedology

The site occurs in an area where most of the surrounding area has been developed and is characterised by roads and impervious surfaces, which have altered the hydrological processes (i.e. pattern, timing and flow) of the area, with specific mention to runoff patterns. The topographic alteration associated with the construction of the road and residential areas within the catchment have significantly altered the hydrological drivers of the wetland and possibly its extent. The soil in some portions within the footprint area has been impacted due to historic activities, which have led to some alteration of the natural soil characteristics. This has ultimately impacted on the natural hydropedological recharge mechanism (refer to Section 13).

#### 4.5 Vegetation

The site is devoid of any tree species, which is typical of the vegetation type that is characterised by grassed hills and woody ravines / drainage lines. Natural fire occurrences and potential harvesting of firewood have likely excluded the occurrence of woody species from the site at this point in time. It is evident that the vegetation within the site, as described by Mucina and Rutherford (2006), has subsequently been altered and is not considered representative of the reference vegetation type (KwaZulu Natal Coastal Belt Thornveld). This change in vegetation structure is likely attributable to historical earth moving activities, continued disturbance as a result of anthropogenic activities (the informal soccer field) and increased water runoff leading to erosion in areas, limiting vegetation establishment. It was noted during the specialist's field assessment that there has been an increase in woody species recruitment along the road verges in comparison to the satellite imagery of 2009 and 2011. This may be due to reduction in fire frequency as fires now pose a risk to houses, with the

community having now expanded and encroached further upon the study area in comparison to 2009 and 2011.

The two wetland systems identified on site (refer to Section 4.4 for more details) are both considered to be disturbed and modified due to the development of the surrounding houses, roads and stormwater measures, as well as the proliferation of alien plant species (AIP), decreasing habitat integrity and the diversity of floral and faunal species. AIPs observed include *Xanthium strumarium* (Rough cocklebur) and *Persicaria madagascariensis* (Bristly Snakeroot), amongst others. Herbaceous species such as *Bulbostylis* sp., *Imperata cylindrica*, *Sporobolus afrianus* and *Cynodon dactylon* were present throughout.

The remaining open grassland area within the site (Plate 4-8) has been disturbed as a result of various historic and current land use activities. Most notably, the remaining grassland areas of the site are used by the local community members for recreational (sport) activities as well as the grazing of cattle. Plant species observed in the remaining grassland areas include herbaceous species such as *Cynodon dactylon*, *Eragrostis* spp, *Melinis repens*, *Urochloa* sp and *Digitaria eriantha*. Woody species observed close to the roadside include *Vachellia karoo*, *Chamaecrista comosa*, *Dichrostachys cinerea* and *Vachellia* spp. Whilst some of these species are known from the vegetation type, they are also known to be common and widespread species that occur in areas where ecological integrity has been compromised.



**Plate 4-8: Representative images of the remaining grassland areas of the site, including the informal recreational soccer field**

## 4.6 Fauna

The site contains limited faunal species. This is likely a result of the increased human presence within the site, as well as decreased habitat integrity and availability. Faunal species observed are limited to avifauna and insects such as *Danaus chrysippus* (Plain Tiger Butterfly), *Junonia hierta* (Yellow Pansy Butterfly), Genus *Halyomorpha* (Bugs), *Cossypha heuglini* (White-browed Robin-Chat), *Bostrychia hagedash* (Hadada Ibis) and *Motacilla capensis* (Cape Wagtail). The site is unlikely to host an increased diversity of faunal species, with most species that may occur on site being those that are well adapted to disturbed environments and/ or are small and well adapted to living in areas of increased human populations. Dominant faunal species are likely to be those of the common invertebrate and avifaunal classes, with a small number of rodents also potentially [present](#).

## 4.7 Heritage Resources

A preliminary site review determined that the existing building on the site was constructed between 2010 & 2011 (not older than 60 year as required by Section 34(1) of the National Heritage Resources Act). No other cultural and heritage resources were identified on site.

## 5 Project Description

The Mandeni Municipality are proposing the formalisation of the Hlomendlini Sports Facility. The main objectives of the proposed project are to give the surrounding communities access to quality sporting facilities and promote community participation in sporting activities. Municipal Infrastructure Grant (MIG) funds have been allocated to the development and construction of the proposed project.

### 5.1 Existing Infrastructure

According to desktop studies and site visits undertaken, there is a partially constructed building (Plate 4-1) and an existing concrete block on the proposed development site. These will be demolished to make way for the proposed infrastructure detailed in Section 5.2.

### 5.2 Proposed Infrastructure

The proposed development will include construction of the following infrastructure (refer to Figure 1-1):

- A soccer field.
- Open stands.
- Ablutions and changerooms.
- Conservancy tank with a 110mm diameter sewer line from the ablution facilities to the Conservancy tank.
- Water line linking into an existing water meter located offsite.
- A combi court.
- The entire site will be enclosed with a clear view/beta fence with one pedestrian gate and associated guard house, and one service gate entrance / exit.

The above items include the complete scope of works and due to local government financial planning practices, the development will take a phased approach over the two (2) financial years. The following items are proposed for implementation in the current financial year (2021/2022):

- Bulk earthworks, layer works and grassing for soccer field only.
- Stormwater diversion measures.
- Sewerage (limited).
- Water Supply and irrigation.
- Ablution facilities and guard house (limited).
- Open stands (limited).
- Fencing with vehicle and pedestrian access gates.

The remaining items will need to be implemented during the following financial years i.e. 2022/2023 and 2023/2024, subject to available funds.

Details of the proposed infrastructure are provided in the sub-sections below.

#### 5.2.1 Soccer Field Bulk Earthworks, Layer works and Grassing

According to the preliminary designs existing 2m contours have been used in estimating the bulk earthworks quantities. The soccer field area will be cleared, and topsoil will be removed and stockpiled on site. Bulk earthworks will be done over the soccer field, in order to produce a generally flat surface with a 0.7% slope in a northerly direction across the property.

This will require cut to fill excavation works and additional fill material to be imported to site. The preliminary geotechnical investigation determined that colluvial and residual soils may be used as bulk fill. Additional suitable fill material may be required to be sourced from other municipal sites in the area



to supplement this. The additional fill material will be stockpiled on the property and used as fill. The proposed fill material will be tested before use.

On completion of the bulk earthworks, a sand sub-base layer for drainage purposes and additional topsoil material will be imported and compacted prior to the planting of new *Cynodon* grass.

It is noted that construction activities within the valley head seep wetland will only occur in the winter months (refer to Section 10.1 for more detail). Approximately 0.089ha of the wetland habitat will be lost.

### **5.2.2 Stormwater Diversion Measures**

Of critical importance are the stormwater diversion measures that must be put in place to prevent major erosion damage taking place of the newly constructed bulk earthworks platform, as well as drainage around the soccer field. The drainage will be diverted around the field to the eastern corner of the site. The proposed stormwater diversion measures can be summarised as follows:

- Earth cut-off drains to be provided along the southern side parallel to the soccer field. The purpose of these drains would be to capture and divert the overland stormwater flow from the high lying catchment area south of the site.
- Stoned pitched v-drains to be provided along the eastern boundary. These will serve, firstly to divert the flow from existing infrastructure and to collect all overland flow water from the earth cut-off drains along the southern side.

### **5.2.3 Sewerage**

The sewerage system will include the installation of a 110mm pipeline from the ablution facilities to a 9500L underground modular conservancy tank. The Ilembe District Municipality currently assists the Mandeni Municipality with servicing existing conservancy tanks across the municipality. A Services Agreement will be entered into with the Ilembe District Municipality to include this conservancy tank in the routine sewerage removal.

### **5.2.4 Water Supply and Irrigation**

Water supply to the site will be provided by the municipality via a water meter located along Platinum Road. The network will consist of various diameter uPVC, class 12 pipes including all the necessary valves and fittings. Irrigation for the field will make use of the travel canon irrigation system.







### 5.2.5 Ablution facilities and Guard House

The following items will be included in the facility:

- Male and Female toilets.
- A kitchen.
- A storeroom
- A changeroom, including showers.
- Electricity to the ablutions.
- The guard house will initially consist of a prefabricated type structure with the intention of building a brick structure with toilet in the next financial year.

### 5.2.6 Open Stands

The open stands will be cut into the embankment overlooking the main soccer field and will consist of reinforced concrete slabs to accommodate approximately 150 people. The surrounding grassed embankment will also be sloped to cater for additional spectators.

### 5.2.7 Fencing

The proposed project site will be enclosed with a 2,4m high clear view/beta fencing to prevent vandalism taking place and to maintain the security of the site. The proposed project will have two access points, which will be for spectators and motor vehicles located next to the guard house.

Two swing gates, for the main entrance, will be provided with a width of 4.5 metres that will allow passage of vehicles and buses. In addition to the main entrance gate, there will be a side gate which will be used by pedestrians to enter the sporting premises.

## 6 Need and Desirability

In accordance with Item 3(1)(f) in Appendix 1 of GN 326, this chapter provides a motivation for the need and desirability for the proposed project, including the need and desirability of the activity in the context of the preferred development footprint within the approved site.

The Department of Forestry, Fisheries and Environment (DFFE) (previously the Department of Environment Affairs, DEA) has published a “Guideline on Need and Desirability” (DEA, 2017) which contains best practice guidelines for the consideration of the need and desirability of a development involving NEMA listed activities.

Need and desirability is based on the principle of sustainability, set out in the Constitution and in NEMA, and is provided for in various policies and plans, including the National Development Plan 2030. Addressing the need and desirability of a development is a way of ensuring sustainable development – in other words, that a development is ecologically sustainable and socially and economically justifiable – and ensuring the simultaneous achievement of the triple bottom-line.

The guideline sets out a list of questions which should be addressed when considering need and desirability of a proposed development based on Section 24 of the Constitution which calls for the securing of “ecological sustainable development and use of natural resources” and the promotion of “justifiable economic and social development”.

In terms of the proposed development the Need and Desirability is described in the sub-sections to follow.

## 6.1 Environmental Benefits

The Mandeni Municipality is lacking formalised sporting facilities for the communities to utilise. As such, sites such as this project site are being used on an ad hoc basis for recreational purposes. An area of the site has already been denuded of vegetation for the informal soccer field site and numerous footpaths across the site. Should this project not proceed the site will continue to be used informally as a soccer field. Uncontrolled movement within the wetlands on site will continue and the further degradation of these systems and the grassland on site will ensue.

## 6.2 Social-economic Benefits

The main objectives of the proposed project are to give the surrounding communities access to:

- Quality sporting facilities.
- Promote community participation in sporting activities.

In addition, the construction of the proposed project will temporarily address social challenges that the community is currently faced with, such as unemployment.

Having been issued financial backing by means of the Municipal Infrastructure Grant (MIG) from the Department of Co-operative Governance and Traditional Affairs (COGTA) and endorsed by the Department of Public Works' Expanded Public Works Programme (EPWP), this proposed development will provide an important avenue for labour absorption and income transfers to poor households, in the short to medium-term. The EPWP is one of government's key programmes aimed at providing poverty and income relief through temporary work for the unemployed. The EPWP is a nationwide programme covering all spheres of government and State-Owned Enterprises (SOEs). The upgrade of the Sports Facility is a desired project for the municipality due to the field being the only facility that can accordingly cater for sporting facility or large gatherings of people of the community within Hlomendlini. There is a school immediately adjacent to the site that is without sporting facilities. Therefore, the proposed development can potentially benefit the youth in the school and the broader community thus affording

# 7 Policy and Legislation

## 7.1 South African Constitution

The Constitution of the Republic of South Africa Act, 1996 (Act No. 108 of 1996) is the supreme law of the land. In terms of environmental management, the Constitution provides the overarching framework for sustainable development, including the protection of natural resources while promoting economic and social development.

The environmental clause in Section 24 of the Constitution provides that:

*"Everyone has the right –*

- a) To an environment which is not harmful to their health or wellbeing.*
- b) To have the environment protected for the benefit of present and future generations through reasonable legislation and other measures that:*
  - i. Prevent pollution and ecological degradation;*
  - ii. Promotes conservation;*
  - iii. Secure ecologically sustainable development and the use of natural resources while promoting justifiable economic and social development."*

## 7.2 National Environmental Management Act

The National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA) provides for co-operative environmental governance by establishing principles for decision-making on matters affecting the environment, institutions that will promote co-operative governance and procedures for co-ordinating environmental functions exercised by organs of the State, as well as to provide for matters connected therewith. Section 2 of NEMA establishes a set of principles that apply to the activities of all organs of state that may significantly affect the environment. These include the following:

- Development must be sustainable.
- Pollution must be avoided or minimised and remedied.
- Waste must be avoided or minimised, reused or recycled.
- Negative impacts must be minimised.
- Responsibility for the environmental health and safety consequences of a policy, project, product or service exists throughout its life cycle.

Section 28(1) states that:

*“Every person who causes, has caused or may cause significant pollution or degradation of the environment must take reasonable measures to prevent such pollution or degradation from occurring, continuing or recurring.”*

If such degradation/pollution cannot be prevented, then appropriate measures must be taken to minimise or rectify such pollution. These measures may include:

- Assessing the impact on the environment.
- Informing and educating employees about the environmental risks of their work and ways of minimising these risks.
- Ceasing, modifying or controlling actions which cause pollution/degradation.
- Containing pollutants or preventing movement of pollutants.
- Eliminating the source of pollution.
- Remedying the effects of the pollution.

The enforcing authorities for NEMA are the National DFFE and KwaZulu-Natal Department of Economic Development, Tourism and Environmental Affairs (EDTEA) (the provincial environmental authority). For this application, EDTEA is the competent authority.

NEMA provides for the management and protection of environmental resources through inter alia the imposition of Environmental Authorisation requirements.

The EIA Regulations, 2014 (as amended in 2017), promulgated in terms of NEMA, consist of the following:

- Government Notice (GN) 326, which specifies the EIA procedures to be followed.
- GN 327, which provides Listing Notice 1 – activities that require a BA process.
- GN 325, which provides Listing Notice 2 – activities that require a Scoping and Environmental Impact Reporting (S&EIR) process.
- GN 324, which provides Listing Notice 3 – activities in identified geographical areas that require a BA process.

The activities identified for this project fall under Listing Notice 1, which requires a BA process to be undertaken. No activities have been identified under Listing Notice 2, and therefore a full S&EIR is not required for this project.

The proposed relocation will trigger three listed activities under GN 327. The applicable Listed Activities are detailed in Table 7-1.

**Table 7-1: Applicable NEMA Listed Activities**

No.	Activity description	Applicability to proposed project
<b>NEMA EIA Listing Notice 1 (GN 327) – BA process required</b>		
12	The development of ii) infrastructure or structures with a physical footprint of 100m <sup>2</sup> or more; where such development occurs a) within a watercourse.	The proposed sports field and a section of the fenceline will be constructed within the valley head seep wetland. An area of 0.089ha ( <i>890 m<sup>2</sup></i> ) of wetland will be lost.
19	The infilling or depositing of any material of more than 10 cubic meters into, or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles or rock of more than 10 cubic meters from a watercourse".	<i>The proposed development will include the infilling of approximately 1 085 m<sup>3</sup> of the wetland. A total of approximately 1 745 m<sup>3</sup> of wetland and the associated 30m buffer will be infilled.</i>
27	The clearance of an area of 1 hectare or more, but less than 20 hectares of indigenous vegetation.	This listed activity is applicable as the site comprises of mostly <i>indigenous</i> grassland ( <i>KwaZulu-Natal Coastal Belt Thornveld</i> ). <i>Approximately 1.6ha of indigenous vegetation will be cleared.</i>

### 7.3 National Environmental Management: Biodiversity Act

The National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004) (NEM:BA) provides for the management and conservation of South Africa's biodiversity within the framework of the NEMA. In terms of the NEM: BA, the developer has a responsibility for:

- The conservation of endangered ecosystems and restriction of activities according to the categorisation of the area (not just by listed activity as specified in the EIA Regulations).
- Application of appropriate environmental management tools in order to ensure integrated environmental management of activities thereby ensuring that all developments within the area are in line with ecological sustainable development and protection of biodiversity.
- Limit further loss of biodiversity and conserve endangered ecosystems.

The objectives of this Act are to provide, within the framework of the NEMA, for:

- The management and conservation of biological diversity within the Republic.
- The use of indigenous biological resources in a sustainable manner.

The Act's permit system is further regulated in the Act's GN R.1020: Alien and Invasive Species Regulations, 2020, in Government Gazette 43735 dated 25 September 2020 as it relates to the NEM:BA and GN 1003: Alien and Invasive Species Lists, 2020, in Government Gazette 43726 dated 18 September 2020.

The National List of Threatened Ecosystems indicates that the site falls within an ecosystem that is of Least Concern and not critically endangered. According to the KZN Biodiversity Spatial Plan, there are no Critical Biodiversity Areas (CBAs) or Ecological Support Areas (ESAs) associated with the site. According to the National Biodiversity Assessment (NBA, 2018) a small northern portion of the study area is located within the KwaZulu Natal Coastal Belt Thornveld, which is considered a Vulnerable ecosystem and is currently Not Protected.

### 7.4 Biodiversity and Wetland Offset Legislation and Policy

It is noted that this section has been informed by the Freshwater Assessment Report (**Appendix C-1**).

In March 2017, a draft National Biodiversity Offset Policy was published for public comment.<sup>1</sup> According to this document, biodiversity offsets are defined as “conservation measures designed to remedy the residual negative impacts of development on biodiversity and ecological infrastructure, once the first three groups of measures in the mitigation sequence have been adequately and explicitly considered (i.e. to avoid, minimise and rehabilitate / restore impacts). Offsets are the ‘last resort’ form of mitigation, only to be implemented if nothing else can mitigate the impact.”

The South African National Biodiversity Institute (SANBI, 2004) further defines biodiversity offsets as “measurable conservation outcomes resulting from actions designed to compensate for significant residual adverse biodiversity impacts arising from project development after appropriate prevention and mitigation measures have been taken.”<sup>2</sup>

In terms of the draft National Biodiversity Offset Policy (2017), as well as the Western Cape Provincial Guideline on Biodiversity Offsets (Western Cape; 2007), the significance of residual impacts should be identified on a regional as well as national scale when considering biodiversity conservation initiatives. If the residual impacts lead to irreversible loss of irreplaceable biodiversity, the residual impacts should be considered to be of very high significance and when residual impacts are considered to be of very high significance, offset initiatives are not considered an appropriate way to deal with the magnitude and/or significance of the biodiversity loss, and other alternatives should be sought (i.e. the proposed activity should not be authorised in its current form). In the case of residual impacts determined to have medium to high significance, an offset initiative may be investigated. If the residual biodiversity impacts are considered of low significance no biodiversity offset is required.<sup>3</sup>

Whilst thought of as a “last resort” to counteract the cumulative impacts on biodiversity, offset strategies do have the potential to increase the future value of biodiversity within a region. Thus, the recently gazetted draft National Biodiversity Offset Policy (Department of Environmental Affairs (DEA), 2017) aims to provide a set of national guidelines relating to biodiversity offsets for South Africa, since at present, only three sets of provincial draft biodiversity guidelines and/or policies are available, namely the Western Cape (Department of Environmental Affairs and Development Planning (DEA&DP), 2007), Kwa-Zulu Natal (Ezemvelo KwaZulu-Natal Wildlife (EKZNW), 2009, 2010) and Gauteng (Gauteng Department: Agriculture and Rural Development (GDARD), 2013).

The principles enshrined in the draft National Biodiversity Offset Policy (DEA, 2017) aim to support the general principles of the NEMA, by ensuring that “due remedy is obtained for significant adverse impacts on biodiversity resulting from development.” The policy is intended to “contribute to securing priority biodiversity and ecosystem functioning in perpetuity, for the benefit of both present and future generations”.

In terms of biodiversity offsets relating specifically to wetland habitat, the draft National Biodiversity Offset Policy (DEA, 2017) notes that the policy must be read in conjunction with the “Wetland Offsets – A best-practice guidelines for South Africa” (Macfarlane D. *et al.*, 2016). The various protocols for defining wetland impacts and developing appropriate offset metrics were thus considered in the approach to the proposed development.

The concept of a biodiversity offset is relatively new and there is presently no standard method for determining the most suitable biodiversity offset. The objective of biodiversity offsets, through the development authorisation and associated EIA process is to ensure that residual impacts on biodiversity and ecosystem services that are of moderate to high significance (i.e. do not represent a

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<sup>1</sup> It should be noted that at the time this report was prepared, the period for public comment had not yet closed, and therefore, the contents of the policy may be amended in due course.

<sup>2</sup> Business and Biodiversity Offsets Programme (BBOP). 2009. *Biodiversity Offset Design Handbook*. BBOP, Washington, D.C.

<sup>3</sup> Provincial Guideline on Biodiversity Offsets, Western Cape, 2007.

'fatal flaw' from a biodiversity perspective) are compensated by developers in such a way that ecological integrity is maintained and development is sustainable (Macfarlane D. et al 2016).

The significance of a residual negative impact on biodiversity is heavily influenced by the characteristics of the receiving environment, for example, if an area is identified in a bioregional plan or fine scale biodiversity plan as a Critical Biodiversity Area (CBA), a priority site, a listed Protected Area (PA), a threatened ecosystem or habitat containing threatened species or special habitat (Macfarlane D. et al 2016).

Biodiversity offsets generally target features or areas with similar biodiversity as that residually impacted by development but may target features or areas with biodiversity of higher conservation significance. According to "Wetland offsets: a best-practice guideline for South Africa" (Macfarlane D. et al., 2016) the goals of wetland offsets in South Africa are as follows:

- Provide appropriate and adequate compensation for residual impacts on key water ecosystem services and contribute to achieving water resource objectives (including both Water Resource Management and Water Resource Quality Objectives) by:
  - Ensuring "no net loss" in the overall wetland functional area by providing gains in wetland area and/or conditions equal to or greater than the losses due to residual impacts.
  - Directing offset activities that will improve key regulating and supporting services towards those wetlands where these specific services can best be enhanced, and where these offset activities will contribute best to achieving water resource objectives including both Water Resource Management and Quality Objectives.
  - Providing 'in kind' services through offset activities, or substitute services acceptable to affected communities, for residual impacts on direct (provisioning or cultural) services, to ensure that these communities are at least as well off as prior to the development taking place.
- Secure formal protection of wetland systems in a good condition so as to contribute to meeting national biodiversity and protection targets for the representation and persistence of different wetland types, thereby ensuring that cumulative impacts of increased water use, development authorisation and land use change do not jeopardize the ability to meet the country's targets.
- Adequately compensate for residual impacts on threatened or otherwise important (e.g. wetland dependent) species through appropriate offset activities that support and improve the survival and persistence of these species.

There are many different possible kinds of offsets, but in practice they generally fall into the following broad categories as described by the Business and Biodiversity Offsets Programme (BBOP) Handbook (2009):

- "Like for like": Undertaking positive management interventions to restore an area or stop degradation: improving the conservation status of an area of land by restoring habitats or ecosystems and reintroducing native species. Where proven methods exist or there are no other options, reconstructing or creating ecosystems. Also, reducing or removing current threats or pressures by, for instance, introducing sustainable livelihoods or substitute materials. This can either be done on the development site (on-site offset) or a distance from the site (off-site offset).
- Averting risk: Protecting areas of biodiversity where there is imminent or projected loss of that biodiversity; entering into agreements such as contracts or covenants with individuals in which they give up the right to convert habitat in the future in return for payment or other benefits now.
- "Trading up": Providing compensation packages for local stakeholders affected by the development project or monetary compensation for a biodiversity conservation trust (Western Cape Provincial Guideline on Biodiversity Offsets, 2007).

## 7.5 National Water Act

The National Water Act, 1998 (Act No. 36 of 1998) (NWA) recognises that water is a scarce resource which belongs to all people. Therefore, the Department of Water and Sanitation (DWS) aims at implementing laws which will promote equal access to water and the use of water resources.



In this regard, all activities that are listed under Section 21 of the NWA require application for a Water Use Authorisation (WUA) to the DWS.

The activities listed under Section 21 that are applicable to the proposed development include:

- 21c) *Impeding or diverting the flow of water in a watercourse* – this is for the construction of the proposed sports field and associated infrastructure both within the valley head seep wetland and within 500m of the channelled valley bottom wetland.
- 21g) *Disposing of waste in a manner which may detrimentally impact on a water resource* – this is for the construction and operation of the proposed sewer pipeline and conservancy tank, which have the potential to pollute the water resources in the event of a spill or leak.
- 21i) *Altering the bed, banks, course or characteristics of a watercourse* – this is for the construction of the proposed sports field and associated infrastructure both within the valley head seep wetland and within 500m of the channelled valley bottom wetland.

As such, the proposed development requires a WUA application to be submitted to the DWS. Contact with the DWS Licensing section has been made and the required authorisation process is currently being undertaken.

## 7.6 National Heritage Resources Act

The protection and management of South Africa's heritage resources is controlled by the National Heritage Resources Act (No. 25 of 1999) (NHRA). The enforcing authority for this act is the South African Heritage Resources Agency (SAHRA).

In terms of the Act, historically important features such as graves, trees, archaeological artefacts/sites and fossil beds are protected. Similarly, culturally significant symbols, spaces and landscapes are also afforded protection. In terms of Section 38 of the NHRA, SAHRA can call for a Heritage Impact Assessment where certain categories of development are proposed. The Act also makes provision for the assessment of heritage impacts as part of an S&EIR process and indicates that if such an assessment is deemed adequate, a separate Heritage Impact Assessment is not required.

The proposed development does not fall within one of the categories listed in Section 38 of the NHRA and as such a heritage assessment was not undertaken.

## 7.7 Spatial Planning

The Spatial Planning and Land Use Management Act, 2013 (Act No. 16 of 2013) (SPLUMA) is the national framework for spatial planning and land use management in South Africa. SPLUMA mandates all municipalities to operate within the legislative requirements of the Act.

SPLUMA requires national, provincial and municipal spheres of government to prepare Spatial Development Frameworks (SDF) that establish a clear long term vision, guide planning and development decisions across all sectors, provide clear and accessible information, address inclusion and integration of all areas into the social, economic and environmental objectives of the relevant sphere of government, identify risks of particular spatial patterns, indicate priority areas and provide direction for strategic development, infrastructure investment, undertake and consider substantial public engagement and ensure plans and programmes of all spheres of government are coordinated and aligned. In addition, SDFs must outline specific arrangements for prioritising, mobilizing, sequencing and implementing public and private infrastructural and land development investment in the priority spatial structuring areas identified in the spatial development frameworks (eThekweni IDP, 2020/2021).

The vision of the National Development Plan (NDP) is to eliminate poverty and reduce inequality by 2030. The NDP has nine priority areas, namely create jobs, expand infrastructure, use resources

properly, inclusive planning, quality education, build a capable state, fight corruption and unite the nation (eThekweni IDP, 2020/2021).

In relation to the NDP 2030, the proposed project will contribute to the NDP priority areas by creating employment opportunities for both the construction and Operational Phases of the project. Moreover, the project involves the establishment of social infrastructure, which further supports the NDP priority areas.

*The site is zoned Active Open Space and does not require rezoning.*

## **7.8 Other Legislation, Policies, Plans, Guidelines, Spatial Tools and Municipal Development Planning Frameworks**

The following is a list of all additional legislation, policies and/or guidelines of relevant spheres of government that may be applicable to this application:

- Environmental Conservation Act, 1989 (Act No. 73 of 1989) (ECA).
- Health Act, 1977 (Act No. 63 of 1977).
- Occupational Health & Safety Act, 1993 (Act No. 85 of 1993).
- National Forests Act, 1998 (Act No. 84 of 1998).
- Conservation of Agricultural Resources Act, 1983 (Act No. 43 of 1983).
- Mandeni Municipality by-laws.

## **8 Project Alternatives**

Consideration of alternatives is an important element in the EIA process. “Alternatives” are defined in the NEMA EIA regulations, 2014 (GN 326, as amended in 2017), as:

“In relation to a proposed activity, means different means of meeting the general purpose and requirements of the activity, which may include alternatives to the:

- (a) property on which or location where the activity is proposed to be undertaken;
  - (b) type of activity to be undertaken;
  - (c) design or layout of the activity;
  - (d) technology to be used in the activity; or
  - (e) operational aspects of the activity;
- and includes the option of not implementing the activity.”

The role of the EAP is therefore to provide a framework for sound decision-making based on the principles of sustainable development. Potential alternatives that were considered for the proposed development are detailed in the sections that follow.

### **8.1 Property/ Site Location Alternatives**

The Mandeni Municipality found it feasible to construct the new facilities at the existing site, as the site is currently being utilized for recreational purposes albeit it in an informal capacity. As mentioned in Section 5 of this report, the main objectives of the proposed project are to give the surrounding communities access to quality sporting facilities and promote community participation in sporting activities. The site has thus been deemed suitable for the proposed development, whereby no site alternatives have been considered.

### **8.2 Type of Activity Alternatives**

Similar to the points made in section 8.1 above, the facility is already being used in an informal capacity as a Sports Facility, thus making the proposed development not only obvious but logical. Additionally,

the surrounding area is highly modified and residential, as such, the development property does not lend itself to other activity alternatives.

## 8.3 Design or Layout Alternatives

### 8.3.1 Layout Alternatives

Following the pre-application meeting, multiple layout alternatives were considered, taking into account the available land and Sports Facility specification. The selected layout was determined to be the preferred option that would keep traversing and infilling of the wetland to the absolute minimum. The recommendations of the specialist studies (see Section 10) have also informed the design materials selection to ensure minimal disturbance to the surrounding environment.

### 8.3.2 Design Alternatives

#### **Sanitation system**

There is no municipal sewerage system in the area. The initial proposed method to manage sewerage was to make use of a septic tank and soakaway system. The size of the septic tank was determined by means of two percolation tests during the geotechnical investigation. In determining the sizes of the soakaway system required to service ablutions associated with the proposed project, the following considerations were taken into account:

- The assumed effluent loading for the proposed Sports Facility based on the current standards (5 litres per day) for two hundred people (150 spectators and 50 players and support staff) is estimated to be 1 000 litres per day.
- Accordingly, the dimensions of soakaway were based on the following:
  - Daily Effluent Load – 1 000 L/day.
  - Application Rate – 35 L/m<sup>2</sup>/day.
  - Area required – 29 m<sup>2</sup>.
- Length Soakaway required – 14.2 m long x 1.0 m deep x 0.6 m wide.

The septic tank and soakaway system was initially planned to be constructed at the same time as the ablution facilities and would have consisted of the following:

- 110 mm (Un-plasticised Poly Vinyl Chloride) uPVC class 34 sewer pipes on class 3 bedding.
- Reinforced concrete septic tank.
- Soakaway.

However, the freshwater assessment undertaken by SAS, identified potential risks to the valley seep head wetland with the installation and operation of a septic tank and soakaway system. Instead, the option of a conservancy tank was proposed by the specialist as a potential alternative to the septic tank and soakaway system. The preferred method of sewerage management is therefore the use of a conservancy tank. The septic tank and soakaway option have been replaced by a 9500L underground modular conservancy tank.

The conservancy tank will be emptied once a month by the Ilembe District Municipality.

#### **Fencing**

The proposed project premises will be enclosed with 2,4m high clear view fencing to prevent vandalism taking place and to maintain the security of the site. The proposed project will have two access points, which will be for spectators and motor vehicles locate next to the guard house.

Two swing gates, for the main entrance, will be provided with a width of 4.5 metres that will allow passage of vehicles and buses. In addition to the main entrance gate, there will be a side gate which will be used by pedestrians to enter the sporting premises.

Two alternative types of fencing have been considered, concrete palisade fencing and clear view/beta fence. Whilst the palisade fencing is more cost effective, the clear view/beta fencing will require installation of fewer fence posts thereby reducing the impact on the wetland, as such, the clear view/beta fencing is the preferred alternative.

The freshwater specialist suggested a third alternative i.e. post and wire fence, be utilised for the proposed fence line. Although clear view fencing is suitable for security as it cannot be easily removed or cut, it does limit the movement of fauna (with only insects and avifaunal species able to navigate it). Due to the security concerns clear view fencing will be used. A suitable faunal specialist will assist in designing under tunnels for larger faunal species (such as porcupine) to minimise the potential impact on the faunal species.

## 8.4 Operational Alternatives

No operational alternatives have been identified.

## 8.5 Preferred Option

Based on the information provided above, the proposed formalization of the Sports Facility (as described in Section 5.2) has been selected as the preferred alternative.

## 8.6 No-go Alternative

The Mandeni Municipality is lacking formalised sporting facilities for communities to utilise. As such, sites such as this project site are being used on an *ad hoc* basis for recreational purposes. An area of the site has already been denuded of vegetation for the informal soccer field site and there are numerous footpaths across the site. Should this project not proceed the site will continue to be used informally as a soccer field. Uncontrolled movement within the wetlands on site will continue and it is likely that further degradation of these systems and the grassland may occur.

# 9 Public Participation

A Public Participation Process (PPP) [was](#) undertaken with the intent of informing surrounding landowners and key local communities about the proposed development and the BA process. Public participation plays an important role in the compilation of environmental reports as well as the planning, design, and ultimately the implementation of the project. Public participation is a process leading to informed decision-making, through joint effort by the proponent, technical experts, governmental authorities, and systematically identified interested and affected parties (I&APs).

Public participation is a vehicle for public input, which achieves the following:

- Facilitates negotiated outcomes.
- Creates trust and partnership.
- Minimises negative effects.
- Maximises positive effects.
- Provides an indication of issues, which may:
  - Prevent the project continuing.
  - Cause costly delays later.
  - Result in enhanced and shared benefits.

The PPP [was](#) undertaken in accordance with Chapter 6 of the EIA Regulations, 2014 (as amended in 2017). The process undertaken is detailed in the sub-sections that follow.

## 9.1 Pre-application Meeting

A pre-application meeting was held virtually via Microsoft Teams with the EDTEA on 17 June 2021, where the proposed development was presented and discussed. The listed activities in terms of NEMA EIA Regulations, 2014 (as amended in 2017) were also discussed with EDTEA. EDTEA confirmed that they agreed with the proposed approach and listed activities identified under the NEMA EIA regulations.

The minutes of the pre-application meeting are attached in **Appendix D-1**.

## 9.2 Identification of Interested and Affected Parties

The PPP for the project was initiated with the development of a comprehensive I&AP database (refer to **Appendix D-2**). The following main I&APs were identified:

- EDTEA.
- Department of Water and Sanitation (DWS).
- Mandeni Local Municipality.
- Ilembe District Municipality.
- KwaZulu-Natal Department of Agriculture and Rural Development.
- Ezemvelo KZN Wildlife.
- KZN Department of Transport ([KZN DOT](#)).
- Local ward councillor (Ward 4).

## 9.3 Project Announcement

### 9.3.1 Advertisements

The community to be impacted by the proposed project is majority isiZulu speaking and as such, an isiZulu advertisement was placed in the Ilanga Newspaper on the Monday, 16 August 2021. The aim of the advertisement was to inform the public in the area of the proposed development in order to canvass the issues and concerns of the broader public. This was done to ensure that all potential I&AP's were invited to register for the project and afforded the opportunity to comment on the proposed development.

A copy of the advertisement is included in **Appendix D-3**.

### 9.3.2 Background Information Document (BID)

isiZulu fliers (i.e., the isiZulu advertisement) were distributed via hand delivery on 12 August 2021 to adjacent residents and landowners, [the contact details of which were collected for the notification of availability of the DBAR](#).

An English Background Information Document (BID) was compiled and distributed electronically to the I&APs on the database on Monday, 16 August 2021. The BID provided a brief overview of the proposed development and an explanation of the BA and WULA processes being followed. The purpose of the BID was to inform I&APs of the project and afford them an opportunity to register as an I&AP and provide comment.

A copy of the BID has been included in **Appendix D-4** along with the proof of notification of I&APs.

### 9.3.3 Site Notices

Three (3) A2-size, laminated posters, in both English and isiZulu, were placed on Thursday, 12 August 2021 in the following locations:

- One English and isiZulu site notice placed at local Tuckshop on Platinum Road, south-west of the site (29°11'25.42"S 31°23'33.53"E).
- One English and isiZulu site notices placed on fence of a property along [the](#) eastern boundary of proposed sports facility (29°11'24.10"S 31°23'42.15"E).
- One English and isiZulu site notice placed along Platinum Road, on [the](#) western boundary of the site (29°11'22.38"S 31°23'33.43"E).

The purpose of the site notices was to inform passers-by of the proposed development and how to register and comment. A copy of the content of the site notice, the GPS co-ordinates of the locations and photographic proof of placement has been included in **Appendix D-5**.

## 9.4 Draft Basic Assessment Report

The Draft BA Report [was](#) circulated for a 30-day comment period from the Friday, [22 October 2021](#) to Monday, [22 November 2021 \(refer to Appendix D-6 for proof of notifications\)](#). The following [was](#) undertaken:

- The Draft BA Report, with a complete set of appendices [was](#) uploaded onto the SRK website.
- I&APs on the database [were](#) notified via email of the availability of the Draft BA Report for review and comment. The link to the SRK website [was](#) provided and the closing date for comments (i.e. 30 days) stipulated, together with the forms of communication available to submit comments.
- The following commenting authorities [were](#) contacted to determine how they would like to receive copies of the Draft BA Report:
  - EDTEA.
  - DWS.
  - Mandeni Local Municipality.
- [A hard copy report was sent to EDTEA via courier.](#) To ensure all health and safety regulations and protocols [were](#) adhered to, it [was](#) noted that a hard copy of the Draft BA Report [would](#) not [be](#) made available in any public locations (e.g. local library, Ward Councillor's office or Mandeni Local Municipality Reception).
- Where hard copies of documents [were](#) submitted to I&APs, the following [was](#) undertaken:
  - Only one person from SRK compiled the hard copies of the report. The designated person [was](#) subjected to SRK's internal COVID Risk Assessment process.
  - Prior to handling the reports, the responsible person used [d](#) hand sanitizer and [wore](#) a mask for the duration of the compilation thereof.
  - All hard copy documents [were](#) delivered via courier. A reputable courier that follows all required protocols [was](#) used.

## 9.5 [Summary of I&AP Issues Raised](#)

[All comments received from the circulation of the Draft BA Report are captured, with responses thereto in Table 9-1 \(refer to Appendix D-7 for copies of all correspondence received\).](#)

**Table 9-1: Summary of comments and responses from the circulation of the Draft BA Report**

<u>Date</u>	<u>Commentator</u>	<u>Organisation</u>	<u>Comment</u>	<u>Response</u>
<u>25 November 2021</u>	<u>Mr. L. Sibiya</u>	<u>EDTEA</u>	<p><u>The draft BAR for the above-mentioned project as received by the Department on 25 October 2021 has been finally reviewed. The following comments need to have been addressed upon submission of the Final BAR in this office:</u></p> <ol style="list-style-type: none"> <li><u>1) The interpretation of Activity 27 under Executive summary of the report is wrong. Please correct this.</u></li> <li><u>2) Please provide coordinates for wetlands where the infilling will take place.</u></li> <li><u>3) Section 2 on the application form under listed activities please revise your explanation on the applicability of the listed activities e.g. The infilling of sand, soil rocks e.tc should be on cubic metres not in square metres.</u></li> <li><u>4) The application form and the report fails to indicate how much of indigenous vegetation in terms of Activity 27 of LN 1 is expected to be removed on site to accommodate the sports facility.</u></li> <li><u>5) Are there no structures such as buildings within 32 metres of a wetland which might exceed a physical footprint of 100 square metres or more?</u></li> <li><u>6) Section 5.1.3 (b) under Waste Management in the EMPr is not enforceable. Please reword "at convenient intervals" as this is not auditable, rather specify when this must happen.</u></li> </ol>	<p><u>The comments have been noted and responses provided hereunder.</u></p> <ol style="list-style-type: none"> <li><u>1) The error has been rectified.</u></li> <li><u>2) The infilling of the wetland will take place at the following coordinates:</u>  <u>29°11'26.61"S 31°23'39.70"E</u>  <u>29°11'26.46"S 31°23'39.47"E</u>  <u>29°11'26.07"S 31°23'39.46"E</u>  <u>29°11'25.52"S 31°23'39.82"E</u>  <u>29°11'25.01"S 31°23'40.55"E</u>  <u>29°11'24.14"S 31°23'41.33"E</u>  <u>29°11'24.39"S 31°23'41.39"E</u>  <u>29°11'26.23"S 31°23'39.74"E</u></li> <li><u>3) The applicability of each listed activity applied for has been revised in the application form and all references in the BA Report and EMPr.</u></li> <li><u>4) A total area of approximately 1.6ha of indigenous vegetation will be cleared. This has been updated in the application form and all references in the BA Report and EMPr.</u></li> <li><u>5) It is confirmed that there are no buildings within 32m of the wetland.</u></li> <li><u>6) Noted. Section 5.1.3b) of the EMPr has been amended to read as follows, "Bins and / or skips for waste will be provided within the construction camp and replaced when the bins and /or skips reach capacity. Bins will be equipped with a closing mechanism to prevent their contents from blowing out and have liner bags for efficient control and safe disposal of waste. Proof of disposal must be retained in the Environmental File for the duration of the construction period."</u></li> </ol>



<u>Date</u>	<u>Commentator</u>	<u>Organisation</u>	<u>Comment</u>	<u>Response</u>
			<p>7) <u>Please avoid use of may, appropriate, should, where possible etc. when making a condition to a construction team as this is not enforceable and auditable.</u></p> <p>8) <u>Please provide a detailed rehabilitation plan, alien invasive vegetation programme.</u></p> <p>9) <u>Please ensure mitigation measures as proposed by the specialists are incorporated in the EMPr.</u></p> <p>10) <u>Please provide a detailed Method statement for infilling within a wetland.</u></p> <p>11) <u>Furthermore, it is emphasised that the EMPr follows the logical assessment of impacts as stated below to ensure auditable and enforceable activity/ies:</u>  <u>Project Description → Link to listed activity → Assessment of ALL impacts (including comparative assessment of alternatives) → Mitigation Measures and Recommendations → Translation into a detailed site specific EMPr.</u></p>	<p>7) <u>Noted. This has been addressed throughout the EMPr.</u></p> <p>8) <u>The rehabilitation plan, alien invasive vegetation programme has been compiled and is included in Appendix G of this Final BA Report and Appendix D of the EMPr.</u></p> <p>9) <u>Noted. Mitigation measures proposed by specialists have been incorporated into the EMPr.</u></p> <p>10) <u>A method statement is included in Appendix H of this Final BA Report. The Engineer has, however, noted that the contractor will only be appointed after the Environmental Authorisation is received, assuming such. The contractor may require an amendment to the method statement. Should this be required, the amended method statement will be submitted to the EDTEA for approval prior to commencement of construction.</u></p> <p>11) <u>The EMPr has been updated to provide the link between the Listed Activities triggering the need for an Environmental Authorisation, the associated potential impacts and the respective mitigation measures provided in Section 5 of the EMPr.</u></p>
<u>16 November 2021</u>	<u>Ms/Mr S.B. Thabede</u>	<u>KwaZulu-Natal Agriculture and Rural Development</u>	<ul style="list-style-type: none"> <li><u>The proposed project will not impact any agricultural lands, however, there are natural resources that are going to be impacted by the proposed development.</u></li> <li><u>The site where development is proposed is partly vacant with a partially constructed building.</u></li> <li><u>As per attached map depicting the wetland habitat loss associated with the proposed main soccer field only a small portion of habitat will be lost mainly over an area classed as Valley Head Seep Wetland.</u></li> <li><u>The office is happy that ablution facilities and combi courts will be allocated far away from any available freshwater features (Channelled valley bottom wetland, Valley Head Seep Wetland and Drainage Feature).</u></li> </ul>	<p><u>Comment noted. Section 13 of this report provides an assessment of the potential impacts on the natural resources.</u></p> <p><u>This statement is correct.</u></p> <p><u>This statement is correct.</u></p> <p><u>Comment noted.</u></p>



<u>Date</u>	<u>Commentator</u>	<u>Organisation</u>	<u>Comment</u>	<u>Response</u>
			<ul style="list-style-type: none"> <li><u>The attached hydrological assessment report:</u> <ul style="list-style-type: none"> <li><u>Concluded that the proposed sports field development poses a moderate risk to the integrity of the wetlands within the study area.</u></li> <li><u>Was able recommend a wetland offset option and rehabilitation measures through re-introduction of indigenous vegetation, implementation of erosion control with wetlands and their buffer zones in order to prevent sedimentation.</u></li> </ul> </li> <li><u>Such conclusion from the report generally indicates that lesser risk will be posed over the environment in the area by the proposed development.</u></li> <li><u>Generally, land use Regulatory unit is happy with the submitted report as all areas pertaining preservation of natural resources on site were covered that is calculated and assumed through the attachment of relevant studies with relevant recommendations.</u></li> <li><u>The implementation and Evaluation plan are now so important as to minimise the degradation of natural resource that are onsite and those at vicinity.</u></li> </ul> <p><u>Please be advised that the Provincial Department of Agriculture and Rural Development: Land Use Regulatory Component recommends the proposed development of HLOMENDLINI SPORTS FIELD. The support is on the basis that all recommendations from specialists are observed and implemented and a special attention is posed to the wetland regarding prevention of unnecessary pollution.</u></p>	<p><u>Comment noted. Further to this, a detailed wetland rehabilitation plan and alien invasive management programme has been compiled (see Appendix G) and included in the EMPr for implementation.</u></p> <p><u>Comment noted. A detailed assessment of potential impacts is provided in Section 13 of this report.</u></p> <p><u>Comment noted.</u></p> <p><u>Comment noted. A detailed wetland rehabilitation plan and alien invasive management programme has been compiled (see Appendix G) and included in the EMPr for implementation.</u></p> <p><u>Comment noted. The mitigation measures proposed by the specialists have been included in the EMPr, which will become a legally binding document should it be approved as part of the Environmental Authorisation, assuming such.</u></p>
<u>16 August 2021</u>	<u>Ms. R. Pillay</u>	<u>DWS</u>	<p><u>Please be advised that I have directed your email to Mr S. Govender (Acting Deputy Director: WQM). Please refer to the attachment.</u></p> <p><u>You may contact him directly via email at govenders2@dws.gov.za</u></p>	<u>Ms. Pillay was thanked, and all further correspondence sent directly to Mr. Govender. It is noted that the proposed development requires a WUA application to be submitted to the DWS. Contact with the DWS Licensing section has been made and the required authorisation process is currently being undertaken.</u>
<u>9 November 2021</u>	<u>Ms. J. Reddy</u>	<u>KZN DOT</u>	<u>Attached is a checklist for all developments. Please submit any outstanding documents, thanks.</u>	<p><u>The locality map and layout plan were submitted to the DOT.</u></p> <p><u>The site is bound by a portion of Platinum Drive which begins in Padianager (a small residential area in Mandini). A Traffic Impact Assessment (TIA) was also conducted. It was noted therein that the sportsfield will not be utilised for large matches or contests that will bring about severe traffic volumes. Moreover, the area</u></p>
<u>23 November 2021</u>			<u>Please send me a detailed to scale locality and site plan so that I can look at it and advise you, thanks</u>	

<a href="#">Date</a>	<a href="#">Commentator</a>	<a href="#">Organisation</a>	<a href="#">Comment</a>	<a href="#">Response</a>
<a href="#">29 November 2021</a>			<a href="#">Do you know which roads are affected, thanks</a>	<a href="#">surrounding the proposed development is predominantly residential in nature and is classified as a low vehicle ownership area; the majority of the community members who are most likely to utilise the facility will either walk to the development or travel by public transport.</a> <a href="#">No further response has been received from the DOT.</a>

## 10 Specialist Studies

Five specialist studies, detailed in Table 10-1, were undertaken for the project. The purpose of the studies was to investigate the potential risks and/or impacts associated with the project on traffic, the ecology of the freshwater and terrestrial ecosystems, and obtain information on the physical properties of soil earthworks and foundations for proposed structures.

**Table 10-1: Specialist studies undertaken for the proposed development**

Specialist Study	Company	Lead Specialist	Professional Registration
Freshwater Ecological Assessment	Scientific Aquatic Services	Rabia Mathakutha	Cand.Sci,Nat
		Stephen van Staden	Pr. Sci. Nat
Hydropedological Opinion	Scientific Aquatic Services	Stephen van Staden	Pr. Sci. Nat
Terrestrial Impact Statement	Scientific Aquatic Services	Christopher Hooton	
		Nelanie Cloete	Pr. Sci. Nat
Geotechnical Assessment	SRK Consulting	Shannon Krebs	Pr. Sci. Nat
		Colin Wessels	Pr. Sci. Nat
Traffic Impact Assessment	NSA Consulting Engineers	Neeraj Sunker	Pr.Eng
		Nicolene Padayachee	

### 10.1 Freshwater Ecological Assessment

This section was informed by:

*Freshwater Ecological Assessment as Part of the Environmental Assessment and Authorisation and Water Use Licence Authorisation Processes for the Proposed Hlomendlini Sports Facility in Mandeni, KwaZulu-Natal Province. (SAS/SRK 230321, August 2021). Refer to **Appendix C-1**.*

#### 10.1.1 Objective

The objective of the investigation was to define the ecology of the freshwater ecosystem associated with the proposed development site in terms of the natural freshwater ecosystem characteristics, including mapping of the freshwater ecosystem, defining areas of increased EIS, and defining the PES of the freshwater ecosystems associated with the study area. Additionally, the study sought to define the socio-cultural and ecological service provision of the freshwater ecosystem and provide the Recommended Management Objectives (RMO), Best Attainable State (BAS) and Recommended Ecological Category (REC) for the freshwater ecosystems. The report also aimed to assess and provide detailed information to guide the proposed project in the vicinity of the freshwater ecosystem, to ensure the ongoing functioning of the ecosystems such that local and regional conservation requirements and the provision of ecological services in the local area are supported.

#### 10.1.2 Findings

A site assessment was undertaken in February 2021 with the purpose of achieving objectives detailed in Section 10.1.1. Table 10-2 provides a summary of the assessment.



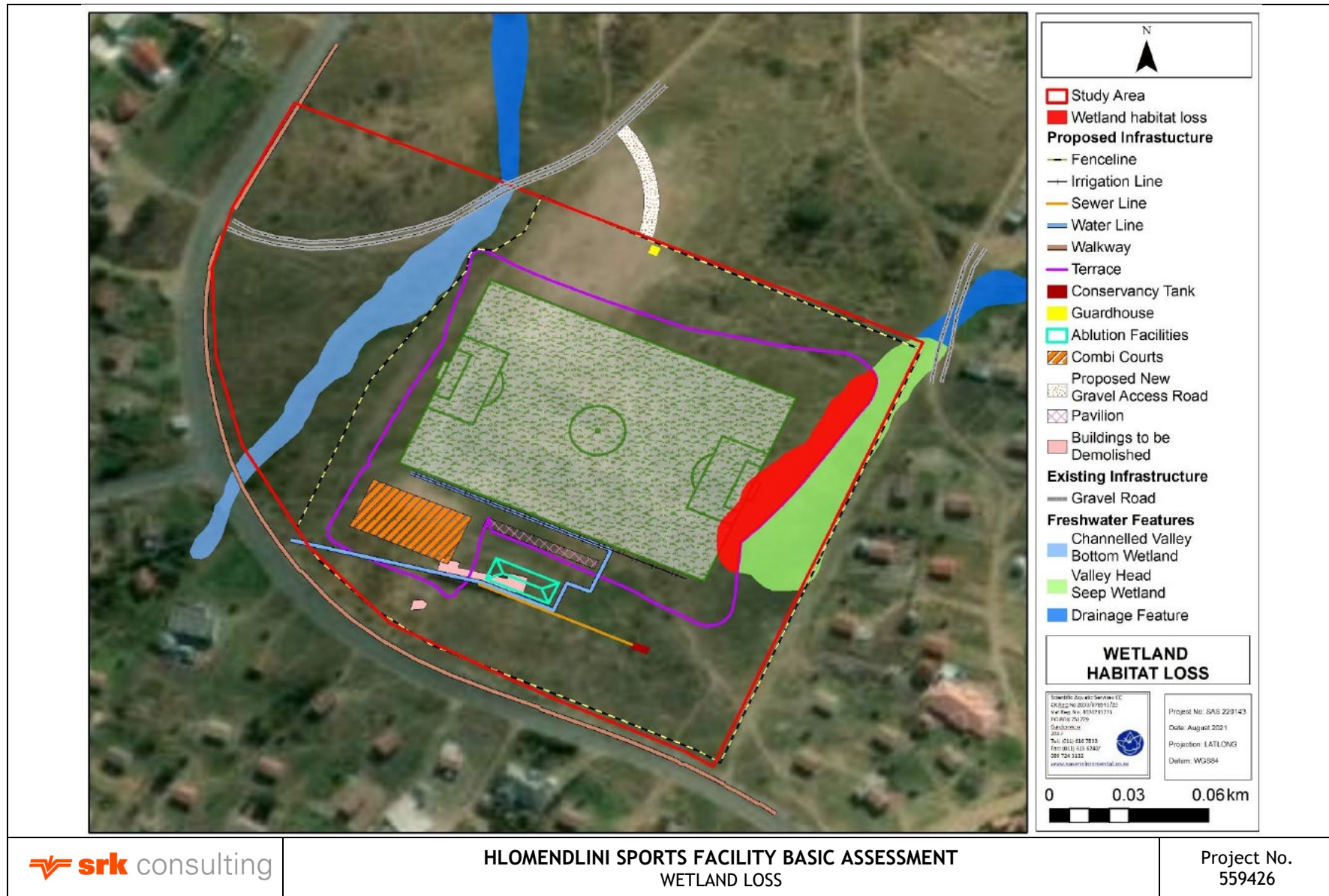
**Table 10-2: Summary of results of the field assessment for the CVB wetland**

Wetland	PES	Ecoservices	EIS	REC and RMO
CVB wetland	Category: E (Seriously modified)	Intermediate	Moderate	REC: Category D (Largely modified) BAS: Category: D (Largely modified) RMO: Improve
Extent of modification anticipated	None No modification is anticipated to the extent of CVB wetland as no infrastructure is proposed within the CVB wetland that may fragment or degrade the system. However, stormwater releases alongside the delineated CVB wetland will need to be monitored to ensure base flows, quantity or quality of water within the CVB wetland are not adversely affected.			
Impact Significance	While no direct impacts are anticipated to the CVB wetland, activities associated with the proposed project including the removal of vegetation, ground-breaking, excavations, infilling and the construction of stormwater outlet structures will take place adjacent to the delineated edge of the CVB wetland, thus posing a moderate risk significance to the integrity of the CVB wetland. It is thus imperative that adherence to cogent, well-conceived and ecologically sensitive construction plans is implemented, and the mitigation measures provided in this report as well as general good construction practice are adhered to. With implementation of Sustainable Drainage systems (SuDs) to assist with polishing of water prior to release into the CVB wetland, the long-term impacts to the CVB wetland can be considered manageable. It is strongly recommended that small scale rehabilitation be included as part of the development, including AIP control to assist with obtaining the REC of Category D.			

**Table 10-3: Summary of results of the field assessment for the valley head seep wetland**

Wetland	PES	Ecoservices	EIS	REC and RMO
Valley head seep	Category: C (Moderately modified)	Intermediate	Moderate	REC: Category C (Moderately modified) BAS: Category: C (Moderately modified) RMO: Maintain
Extent of modification anticipated	High Significant modifications are anticipated to the extent of the valley head seep wetland associated with the proposed main soccer field, where 0.089 ha of wetland habitat will be lost as a result of the proposed project. Similarly, habitat fragmentation is likely within the seasonal and temporary zones of the wetland. However, an offset investigation was undertaken, and focus was placed on the offset of functional Hectare equivalents (hae) to ascertain the functional habitat hectare equivalents that must be conserved by the proponent to account for the above-mentioned residual wetland loss and ensure improved functionality and ecological integrity of the remaining wetland extent. Stormwater released from the proposed project into the adjacent valley head seep wetland must be appropriately attenuated and released in a dispersed manner before entering the wetland to prevent incision and erosion.			
Impact Significance	As the infrastructure associated with the proposed project including the proposed main soccer field and terrace encroaches into the western extent of the valley head seep wetland, 0.089 ha of wetland habitat will be lost.  As such, the development activities are considered to pose a moderate risk to the integrity of the valley head seep wetland. Some of the activities associated with the construction of the proposed project, including the removal of vegetation, ground-breaking, excavations, infilling and associated concrete works will necessitate work within the valley head seep wetland, thus posing a moderate risk to the overall integrity of the valley head seep wetland and an anticipated loss of 0.089 ha of wetland habitat. An offset investigation was undertaken, and it was determined that a conservation offset is not appropriate and thus focus was placed on the offset of functional hectare equivalents to ascertain the functional habitat hectare equivalents that must be conserved by the proponent to account for the above-mentioned residual wetland loss, results provided in Section 8 of this report. It is recommended that rehabilitation of the valley head seep wetland be undertaken to improve the functionality and ecological integrity of the wetland. Furthermore, it is imperative that adherence to cogent, well-conceived and ecologically sensitive construction plans is implemented, and the mitigation measures provided in this report as well as general good construction practice are adhered to.			

Based on the findings of the wetland assessment and the results of the risk assessment, it is the opinion of the freshwater ecologist that the proposed project poses a Moderate risk to the integrity of the wetlands within the study area, predominantly due to the infilling of the valley head seep wetland associated with the proposed main soccer field and terrace to create a flat platform for the proposed project. This activity will result in habitat fragmentation and the loss of 0.089 ha of wetland habitat in the valley head seep wetland (refer to Figure 10-1).



**Figure 10-1:** Map depicting the wetland habitat loss associated with the proposed main soccer field and terrace within the western extent of the valley head seep wetland



### 10.1.3 Recommendations

Based on the findings of the wetland assessment and the results of the risk assessment, it is the opinion of the freshwater ecologist that the proposed project poses a Moderate risk to the integrity of the wetlands within the study area, predominantly due to the infilling of the valley head seep wetland associated with the proposed main soccer field and terrace to create a flat platform for the proposed project. This activity will result in habitat fragmentation and the loss of 0.089 ha of wetland habitat in the valley head seep wetland. It is considered imperative that all mitigation measures as provided in Section 13.1 are strictly adhered to, to minimise the impacts associated with the proposed project.

The following additional mitigation measures are considered imperative for the proposed project:

- If the proposed activities are undertaken during the drier winter months, impacts to the hydrological and geomorphological regimes of the wetlands can be managed.
- Heavy earthworks within the wetlands, particularly for the construction of the proposed main soccer field and terrace within portions of the valley head seep wetland, and concrete works must be carefully controlled, and major terracing should be avoided.
- All footprint areas must immediately be revegetated after the construction activities are completed. This will ensure fast recovery of the wetlands post construction activities.
- It is strongly recommended that the proponent makes provision for a stormwater management plan to service the proposed project. Careful planning of the stormwater management plan that will ensure that stormwater is released in an attenuated manner outside of the wetlands, is imperative to ensure the hydraulic regime of the receiving wetlands is retained.
- Small-scale rehabilitation, including revegetation with indigenous wetland vegetation and control of AIP vegetation is strongly recommended for the valley head seep wetland specifically, and the CVB wetland in general. The long-term impact of rehabilitation activities is considered positive since this will ensure that the ecological service provision of the wetlands is maintained and where feasible, improved.

## 10.2 Hydropedological Opinion

This section was informed by:

*Hydropedological Opinion Report for proposed Hlomendlini Sports Facility and associated infrastructure in Mandeni, Kwazulu-Natal Province. (SAS/SRK 230321, March 2021). Refer to Appendix C-2.*

### 10.2.1 Objective

Mandeni Local Municipality has identified the opportunity to develop an area associated with watercourses that traverse the proposed site. The proposed activities will likely entail earthworks for the preparation of foundations for the proposed development of associated infrastructure, which may intercept the subsurface flows in the vadose zone feeding the watercourse as well as affect vadose zone recharge mechanisms. Thus, it was deemed necessary to investigate the recharge mechanism of the watercourses within and near the proposed site to ensure that development planning takes cognisance of the hydropedologically important areas, and hence enable informed decision making, construction design in support of the principles of sustainable development.

The objective of this assessment was to investigate the hydropedological properties of the soils in the vicinity of the watercourses within the study area. Insights gained from the investigation were used to deduce the potential recharge mechanisms and destination of the transferred water of the surrounding soils that may be affected by the proposed development. It was also an objective to assess the impact of the proposed development activity on the watercourse in terms of the hydropedological drivers.

## 10.2.2 Findings

It was determined during the site assessment that most of the soils associated with the footprint area are shallow, where the topsoil is underlain by either hard rock or plinthic material which largely inhibits infiltration. These soils based on the South African Soil Classification System (2018) can be classified as Mispah and Dresden soil forms. The best suited hydrogeological recharge mechanism definition for these areas is “responsive shallow”. Shallow responsive soils are characterised by limited storage capacity, which results in the generation of overland flow after rainfall events. These soils lead to a rapid runoff response time during intense rainfall events attributed to their shallow nature which inhibits infiltration. The contribution of these soils to wetland recharge is significant during a rainfall event and minimal during drier periods.

During the site assessment, two watercourses depicting wetland characteristics were identified adjacent to the proposed development footprint. The soils showed signs of hydromorphy (i.e. prominent signs of prolonged wetness) whilst vegetation was varied due to the disturbances on site. The proposed development overlaps between two catchment areas of the systems associated with the development. The sensitivity of the systems calculated to be moderately and largely modified for the impacts within the catchment (i.e. stormwater, roads, and residential areas) is considered low and the PES ranges between moderately to seriously modified.

The soils within the associated valley bottom and valley head seep wetlands can be best classified as Kroonstad and Wasbank soil forms. The dominant soil forms and hydrogeological soil responses associated with the study area are depicted in Figure 10-1 and 10-2 respectively.

The construction of the sport field is not anticipated to cause a significant loss of hillslope processes driving the adjacent wetlands on both the local and catchment to the nature of development as well as the absence of hydrogeologically important soils associated with the study area. This is with specific mention to the area where the proposed development is to occur and the portion of the sport field encroaching on the valley head seep wetland.



**Figure 10-2: Dominant soil forms associated with the study area (Source: SAS/SRK 230321, March 2021)**





**Figure 10-3: Hydropedological soil response (Source: SAS/SRK 230321, March 2021)**

### 10.2.3 Recommendations

The following general mitigation and management measures for the construction and operational phases are recommended:

- Excavation and soil disturbances within the wetlands should remain as small as possible;
- Drainage systems associated with the sport field should be designed in a manner discharges clean water back into the adjacent systems in an attenuated manner;
- Water from the sealed surfaces associated with the development should also be collected, and discharged back into the wetland in an attenuated manner;
- The development must ensure that runoff from all surfaces surrounding the development is attenuated before discharging into the adjacent systems, thus recharging the wetlands in an ecologically appropriate manner;
- Following the completion of the construction phase, areas of disturbance should be monitored at least once after an intense rainfall event for erosion arising from the surface runoff management;
- Implementation of erosion control measures to limit loss of soil and sedimentation of the adjacent systems associated with the proposed project; and
- All surface development footprint areas should remain as small as possible and disturbance of soil profiles to be limited to what is essential.

Detailed mitigation measures for the construction and operational phase are contained in Section 13 of this report.

## 10.3 Terrestrial Ecological Impact Statement

This section was informed by:

*Terrestrial Ecological Impact Statement as part of the Basic Assessment Process for the Proposed Hlomendlini Sports Facility and Associated Infrastructure in Mandeni, KwaZulu-Natal Province (SAS 202245, August 2021).* Refer to **Appendix C-3**.

### 10.3.1 Objective

The main objective of this impact statement was a verification memorandum in compliance with the National Screening Tool for the proposed development of a Sports Facility and associated infrastructure development on ERF 1118 in Mandeni.

The verification report followed the requirements as stated in the procedures for the assessment and minimum criteria for reporting on identified environmental themes in terms of Sections 24(5)(A) and (H) and 44 of the NEMA.

### 10.3.2 Findings

The results of the desktop assessment are summarised in the points below (more detail and relevant maps are provided in Appendix A and B of the report).

The desktop findings of the site included:

- The National List of Threatened Ecosystems indicates that the study area falls within an ecosystem that is of Least Concern and not critically endangered, as stated in the National Web-Based Environmental screening tool (2021).
- According to the KZN Biodiversity Spatial Plan, there are no Critical Biodiversity Areas (CBAs) or Ecological Support Areas (ESAs) associated with the study area.
- According to the National Biodiversity Assessment (NBA, 2018) a small northern portion of the study area is located within the KwaZulu Natal Coastal Belt Thornveld, which is considered a Vulnerable ecosystem and is currently Not Protected.

A field investigation to ground truth the desktop findings was undertaken. The broader study area was considered utilising digital satellite imagery prior to and after the field investigation. The survey was undertaken in summer, which allowed for a suitable assessment of the area in terms of floral and faunal species and the overall habitat of the study area.

Satellite imagery from 2009 and 2011 (Plate 10-1) shows that large portions of the site have previously been disturbed as a result of earth moving and dumping activities. In addition, it appears that the site was, at this point, devoid of any tree species, typical of the vegetation type which is characterised by grassed hills and woody ravines / drainage lines. Natural fire occurrences and potential harvesting of firewood likely excluded the occurrence of woody species from the study area at this point in time.



**Plate 10-1: Satellite imagery from 2009 (left) and 2011 (right) indicate that portions of the site have been historically disturbed as a result of earth moving and/or dumping activities**

During the field assessment in February 2021, it was evident that the vegetation within the site, as described by Mucina and Rutherford (2006), has subsequently been altered and is not considered representative of the reference vegetation type (KwaZulu-Natal Coastal Belt Thornveld). This change in vegetation structure is likely attributable to historical earth moving activities (Plate 10-1), continued disturbance as a result of anthropogenic activities (informal soccer field) and increased water runoff leading to erosion in areas, limiting vegetation establishment. It was noted during the assessment that there has been an increase in woody species recruitment along the road verges in comparison to the satellite imagery of 2009 and 2011. This may be due to reduction in fire frequency as fires now pose a risk to houses, with the community having expanded and encroached further upon the site in comparison to 2009 and 2011.





**Plate 10-2: Satellite imagery from 2021 indicating the current informal soccer field in north of the site (yellow circle) as well as disturbed and bare patches still evident in the southern half of the site**

The DFFE screening tool indicated the potential occurrence of *Arytropteris basal* (Flat-necked Shieldback Katydid, VU), Sensitive Species 5 (VU), *Dendrohyrax arboreus* (Southern Tree Hyrax, EN), *Pomatonota dregii* (East Coast Katydid, VU) and *Phymeurus illepidus* (Durban Agile Grasshopper, VU) within the site. Following the field assessment, it is considered unlikely that any of these species will inhabit the site, primarily as the site does not fit the suitable habitat requirements for these species, whilst the continued presence of local residents in and surrounding the study area further reduces this likelihood.

### 10.3.3 Recommendations

Following the desktop and site assessment it is expected that the impacts on the receiving environment resulting from the proposed activities are anticipated to be low, provided they are suitably managed and that all mitigation measures as per the freshwater report (SAS 220143 – included in Section 13.3) are implemented. Furthermore, it is recommended that as part of the development all AIP species are properly controlled and that a landscaping and revegetation plan be developed for the surrounding and disturbed areas.

## 10.4 Traffic Impact Assessment

This section was informed by:

*Traffic Impact Assessment for The Proposed Sportfields Complex in Hlomendlini, Mandeni.* (NSA1262, February 2021). Refer to **Appendix C-4**.

Hlomendlini is rural area located within the Mandeni Local Municipal and is situated approximately 35km north of KwaDukuza. Roads in the area are lacking maintenance and require urgent repairs. Access to the area is via a single lane bridge from the P415 and the proposed development will gain access via Platinum Drive. The area is mainly serviced by public transport, however, private vehicles are also utilized; traffic volumes are extremely low.

The purpose of the proposed project is to provide well equipped sporting facilities and equipment for the community members to utilise. The development will not be utilised for large matches or contests that will bring about severe traffic volumes. Moreover, the area surrounding the proposed development



is predominantly residential in nature and is classified as a low vehicle ownership area; the majority of the community members who are most likely to utilise the facility will either walk to the development or travel by public transport.

The TIA supports the development and provided the following recommendations:

- All parking facilities, accesses and driveways are to be designed and dimensioned in accordance with the schedule of guidelines for off-street parking.
- The access will need to be a minimum of 6 meters wide to accommodate two-way vehicle movements. All gates to remain open during normal operating hours.
- The access bellmouths, and at minimum the first 10 m of the access, must be constructed to blacktop or premix standards. This will prevent the road edges from breaking.
- All driveway ramps to have a maximum gradient of 15% with a minimum 30m vertical curve radius.
- All internal roads are to be designed in conjunction with the Guidelines for Human Settlement planning and Design (Red Book).

## 10.5 Geotechnical Investigation

This section was informed by:

*Mandeni Hlomendlini Sports Facility Project – Geotechnical Investigation Report, undertaken by SRK Consulting (SRK 559426, dated March 2021). Refer to **Appendix C-5**.*

The intrusive geotechnical investigation comprised the excavation of four test pits, twenty Drop Cone Penetrometer (DCP) tests, two percolation tests and laboratory testing of samples retrieved from test pits. This investigation was carried out by SRK during January 2021.

The site is underlain by tillite of the Dwyka Group, which forms part of the Karoo Supergroup. In the test pits colluvium and residual tillite were typically intersected at a depth range from surface to an average depth of 0.3 m and from an average depth of 0.3 m to 1.6 m below existing ground level. Un-engineered fill was observed in one test pit from 0.1 m to 0.4 m. The colluvium classifies as silty sand (SM), the residual soils classify as clayey sand (SC), clayey sand with gravel (SC-SM) and silty clayey gravel (GC-GM). The residual tillite soils classify as G8 in terms of the TRH14 guidelines<sup>4</sup>.

Based on the results from the test pits and DCPs, the soils underlying the study area generally have a medium dense consistency, having an E Modulus value ranging from 10 to 30 MPa.

The colluvial and residual soils may be used as bulk fill. Soft excavation in terms of SANS 1200D is likely to be encountered from surface to approximately 1.6 m below existing ground level. Intermediate becoming hard rock excavation is likely to be encountered at depths greater than 1.6 m. The results of two percolation tests undertaken on site, indicate an average application of effluent to subsoil infiltration areas of 35 litres per m<sup>2</sup> can be expected from the underlying subsoil material encountered on site.

The grandstand and ablution facilities should be founded on competent tillite bedrock at depths ranging from 1.0 m to 1.6 m below existing ground level. Where the remaining proposed structures are to be founded on colluvial soils and residual tillite, they are considered Site Class S1/S2 and the foundation design as described above should be adhered to.

Geotechnical constraints affecting, but not limiting development within the study area to any significant degree, include areas requiring removal of boulders, moderate compressible nature of the soils overlying the tillite bedrock, low lying areas affected by flooding, low lying areas with a perched water

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<sup>4</sup> Technical Recommendations for Highways (TRH14): Guidelines for Road Construction Materials. Prepared for the Department of Transport. Committee for State Road Authorities. (1989).

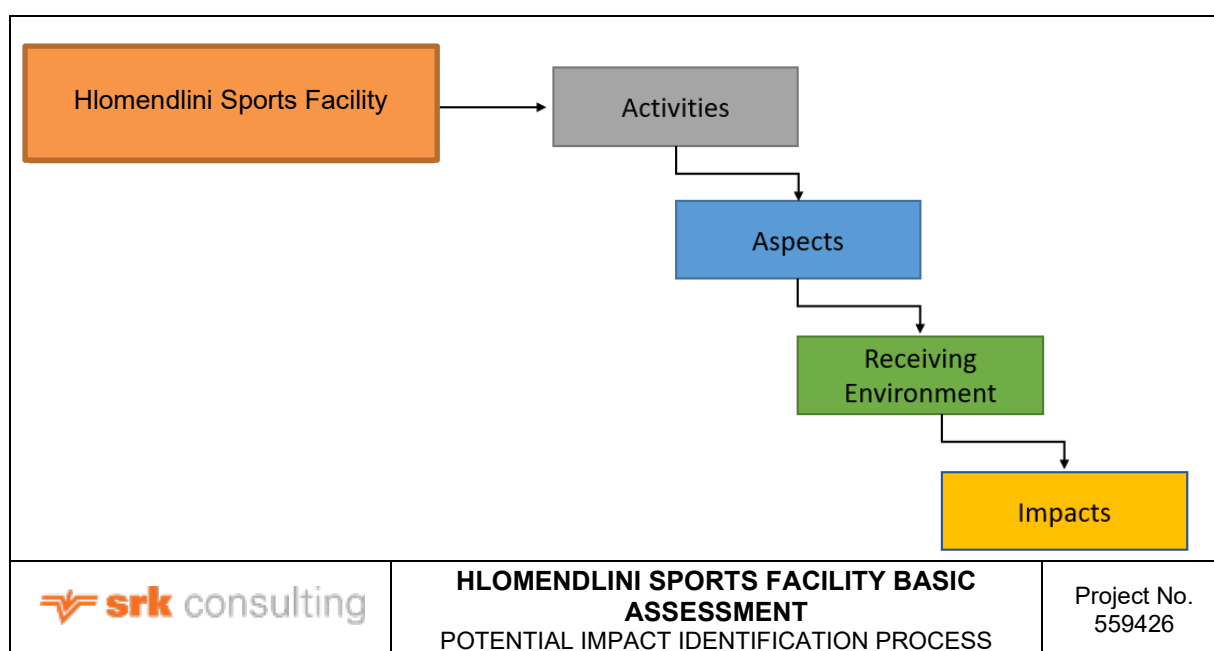
table, areas of intermediate soil erodibility and areas of difficult excavation conditions (bedrock <1.5 mbgl).

The geotechnical report is based on preliminary investigations within the area with minimal representative test locations and the recommendations given are based on information gathered from this. To determine the site specific geotechnical characteristics for foundations and on-site sewerage disposal detailed investigations by an Engineering Geologist or Geotechnical Engineer will be undertaken during the construction phase of the project.

## 11 Impact Identification Process

In accordance with Items 3(1)(h) and (i) in Appendix 1 of GN 326, this chapter provides a description of the process followed to identify potential impacts and risks of the proposed activities and associated structures and infrastructure on the receiving environment.

The process undertaken to identify and characterise potential impacts is illustrated in Figure 11-1.



**Figure 11-1: Potential impact identification process**

The consecutive steps of the process undertaken to identify and characterise potential impacts are described below.

### Step 1: Identify activities

Identification of the main activities during the construction and operational phases of the proposed development.

### Step 2: Identify aspects

For each identified activity, the associated environmental and social aspects are identified.

### Step 3: Characterise the receiving environment

The likely sensitivities or vulnerabilities of the receiving environment, as they pertain to the proposed activities and associated infrastructure, are characterised.

### Step 4: Identify potential impacts

Within the context of the proposed activities and the nature of the receiving environment, impacts and risks identified with implementation of the project are considered in terms of potential significance

## 12 Impact Assessment Methodology

The assessment of impacts was based on SRK's professional judgement, field observations and desk-top analysis and, where conducted, specialist studies.

The significance of potential impacts that may result from the proposed project was determined in order to assist decision-makers (typically the EDTEA, and other authorities such as the eThekweni Municipality, DWS etc., but in some instances, the proponent).

The significance of an impact is defined as a combination of the consequence of the impact occurring and the probability that the impact will occur.

The criteria used to determine impact consequence are presented in Table 12-1.

**Table 12-1: Criteria used to determine the Consequence of the Impact**

Rating	Definition of Rating	Score
<b>A. Extent</b> – the area over which the impact will be experienced		
Local	Confined to project or study area or part thereof (e.g. site)	1
Regional	The region, which may be defined in various ways, e.g. cadastral, catchment, topographic	2
(Inter) national	Nationally or beyond	3
<b>B. Intensity</b> – the magnitude of the impact in relation to the sensitivity of the receiving environment, taking into account the degree to which the impact may cause irreplaceable loss of resources		
Low	Site-specific and wider natural and/or social functions and processes are negligibly altered	1
Medium	Site-specific and wider natural and/or social functions and processes continue albeit in a modified way	2
High	Site-specific and wider natural and/or social functions or processes are severely altered	3
<b>C. Duration</b> – the timeframe over which the impact will be experienced and its reversibility		
Short-term	Up to 2 years	1
Medium-term	2 to 15 years	2
Long-term	More than 15 years	3

The combined score of these three criteria corresponds to a Consequence Rating in Table 12-2.

**Table 12-2: Method used to determine the Consequence Score**

Combined Score (A+B+C)	3 – 4	5	6	7	8 – 9
Consequence Rating	Very low	Low	Medium	High	Very high

Once the consequence is derived, the probability of the impact occurring is considered, using the probability classifications presented in Table 12-3.

**Table 12-3: Probability Classification**

Probability – the likelihood of the impact occurring	
Improbable	< 40% chance of occurring
Possible	40% - 70% chance of occurring
Probable	> 70% - 90% chance of occurring
Definite	> 90% chance of occurring

The overall significance of impacts is determined by considering consequence and probability using the rating system prescribed in Table 12-4.

**Table 12-4: Impact significance ratings based on impact probability and consequence**

		Consequence				
		Very High	High	Medium	Low	Very Low
Probability	Definite	Very High	High	Medium	Low	Very Low
	Probable	Very High	High	Medium	Low	Very Low
	Possible	High	Medium	Low	Very Low	Insignificant
	Improbable	High	Medium	Low	Very Low	Insignificant

The impact significance rating should be considered by authorities in their decision-making process based on the implications of ratings ascribed in Table 12-5.

**Table 12-5: Impact significance categories and definitions**

Impact significance	Definition
<b>Very High</b>	The proposed activity should only be approved under special circumstances.
<b>High</b>	The potential impact will affect the decision regarding the proposed activity/development.
<b>Medium</b>	The potential impact should influence the decision regarding the proposed activity/development.
<b>Low</b>	The potential impact may not have any meaningful influence on the decision regarding the proposed activity/development.
<b>Very Low</b>	The potential impact is very small and should not have any meaningful influence on the decision regarding the proposed activity/development.
<b>Insignificant</b>	The potential impact is negligible and will not have an influence on the decision regarding the proposed activity/development.

In the last step the impacts are considered in terms of their status (positive or negative impact). The prescribed system for considering impacts status is provided in Table 12-6.

**Table 12-6: Status of Impact**

Status of impact	
Indication whether the impact is adverse (negative) or beneficial (positive).	+ ve (positive – a 'benefit')
	– ve (negative – a 'cost')

In the report, practical mitigation and optimisation measures are recommended and impacts were rated in the prescribed way both with and without the assumed effective implementation of mitigation and optimisation measures. Mitigation and optimisation measures are either:

Essential: must be implemented and are non-negotiable.

Optional: must be shown to have been considered and sound reasons provided by the proponent if not implemented.

Each potential impact is rated in terms of the following:

**Reversibility**: In order to assess the degree to which the potential impact can be managed and /or mitigated, each impact is assessed twice, as follows:

- Firstly, the potential impact is assessed and rated prior to implementing any mitigation and management measures.
- Secondly, the potential impact is assessed and rated after the proposed mitigation and management measures have been implemented.



The purpose of this dual rating of the impact is to enable comparison of the pre- and post- mitigation significance ratings and to calculate the percentage change, which indicates the degree to which the impact may be avoided, managed, mitigated and /or reversed.

**Irreplaceable Loss:** In order to assess the degree to which the potential impact could cause irreplaceable Loss of Resources (LoR), one of the following classes (%) is selected based on the specialist's informed decision:

5	100% - permanent loss
4	75% - 99% - significant loss
3	50% - 74% - moderate loss
2	25% - 49% - minor loss
1	0% - 24% - limited loss

The Loss of Resources aspect does not affect the overall significance rating of the impact.

## 13 Impact Assessment

This section provides an assessment of the significant potential positive and negative environmental impacts relating to the proposed development. Once a potential issue and/or potential impact has been identified, it is necessary to identify which activity or aspect of the development would result in the impact. By considering the cause of the issue, the probability of the activity resulting in an impact can be determined. The associated impact can then be assessed to determine the significance and to define mitigation or management measures to address the impact.

The assessment of impacts was based on SRK's professional judgement, field observations and desk-top analysis and, where conducted, specialist studies. The following specialist studies were undertaken to inform this chapter:

- Freshwater Ecological Assessment
- Hydropedological Opinion
- Terrestrial
- Geotechnical Assessment
- Traffic Impact Assessment

The significance of potential impacts that may result from the proposed project is determined in order to assist decision-makers.

The potential environmental impacts associated with activities during construction are usually short lived and mitigated in an EMPr (refer to **Appendix E** for the draft EMPr). Once approved, the EMPr will be implemented on-site and enforced by regular monitoring with submission of audit reports to the EDTEA Compliance Department.

### 13.1 Freshwater Ecosystem Impacts

There are four key ecological risks on the wetlands that were assessed, namely:

- Loss of wetland habitat and ecological structure resulting in impacts to biota.
- Changes to the socio-cultural and service provision.
- Impacts on the hydrology and sediment balance of the wetlands.
- Proliferation of alien and invasive plant species.

The assessment of these impacts, with proposed mitigation measures to ameliorate these, is provided in the sub-sections below. The activities associated with the construction and operational phases of the proposed project, which include site preparation, vegetation clearing and excavation and levelling of the platforms for the construction of the proposed project and associated stormwater management, pose a Moderate risk to the overall integrity of the wetlands. The majority of the impacts are considered

fully reversible, except those associated with loss of wetland vegetation of the valley head seep wetland that will be traversed by the proposed main Sports Facility and terrace resulting in 0.089 ha of wetland habitat loss. As such, an offset investigation was undertaken to ascertain the functional and conservation habitat hectare equivalents (hae) that must be conserved by the proponent to account for the residual wetland loss. It is highly recommended that the proponent makes provision for small-scale rehabilitation of the wetlands, particularly the valley head seep wetland which will be directly impacted by the proposed project. This is especially applicable to the removal of alien and invasive plants and the revegetation of the affected areas. These rehabilitation recommendations should be read in conjunction with the rehabilitation measures following the offset considerations as presented in Section 13.1.10 to improve the functionality and ecological integrity of the identified target wetlands.

Indirect impacts may arise from potential water quality concerns and increased sediment loads entering the wetlands through the stormwater channels. It is thus recommended that the proponent makes provision for a stormwater management plan to service the proposed project. Careful planning of the stormwater management plan that will ensure that stormwater is released in an attenuated manner outside of the wetlands, is imperative to ensure the hydraulic regime of the receiving wetlands is retained.

### 13.1.1 Construction: Site preparation prior to construction activities

The movement of construction equipment may have the following potential impacts on the CVB and valley head seep wetlands:

- Loss of wetland vegetation and associated habitat and ecosystem services associated with the proposed water pipelines.
- Indiscriminate movement of construction equipment through the wetlands.
- Transportation of construction materials can result in disturbances to soil and increased risk of sedimentation and/or erosion.
- Soil and stormwater contamination from oils and hydrocarbons originating from construction vehicles.

The removal of vegetation and associated disturbances to the soil, especially the potential clearance of vegetation within the wetland habitat of the valley head seep wetland for the construction of the proposed main soccer field, may have the following potential impacts on the CVB and valley head seep wetlands:

- Loss of freshwater habitat and ecological structure, particularly along the western portion of the valley head seep wetland associated with the proposed main soccer field.
- Exposure of soil, leading to increased runoff and erosion, and thus increased sedimentation of the wetlands.
- Increased sedimentation of the wetlands, leading to smothering of vegetation in the downstream reaches.
- Proliferation of alien and/or invasive vegetation as a result of disturbances.

The assessment of significance of these potential impacts on the CVB and valley head seep wetlands is provided Table 13-1 and Table 13-2, respectively. Provided the mitigation measures are implemented, the potential impacts are fully reversible for the CVB wetland and partially reversible for the valley head seep wetland.

**Table 13-1: Assessment of impacts relating to movement of construction equipment during the construction phase on CVB wetland**

	Extent	Intensity	Duration	Consequence	Probability	Significance	Status	Confidence
Without mitigation	Regional	Medium	Medium-term	Medium	Probable	Medium	– ve	High
	2	2	2	6				

<b>Mitigation measures:</b> <ul style="list-style-type: none"> <li>It is imperative that all construction works be undertaken during the dry, winter months when surface flow is very low within the wetlands, and no diversion of flow would be necessary.</li> <li>Due to the accessibility of the site and the existing roads, no unnecessary crossing of the wetlands may be permitted. This will limit edge effects, erosion and sedimentation of the wetlands during the construction phase.</li> <li>The assessed wetlands and 32m NEMA Zone of Regulation (ZoR) should be clearly demarcated with danger tape by an ECO and marked as a 'no-go' area where no construction activities are planned.</li> <li>Contractor laydown areas, vehicle re-fuelling areas and material storage facilities to remain outside of the wetlands and their associated 32m NEMA ZoR.</li> <li>All footprint areas must remain as small as possible and vegetation clearing to be limited to what is absolutely essential, to ensure as much indigenous vegetation is retained.</li> <li>Vehicles to be serviced at the contractor laydown area and all re-fuelling is to take place outside of the delineated wetlands and 32m NEMA ZoR.</li> <li>Stockpiles should be placed outside demarcated features.</li> <li>Control of alien vegetation, specifically weeds which may find a niche to encroach disturbed areas.</li> <li>All waste to be removed from the site and disposed of at a registered facility.</li> <li>The clearing of vegetation must remain within the development footprint and may not extend beyond this area.</li> <li>No unnecessary disturbance within the wetlands must take place.</li> <li>Retain as much indigenous vegetation as possible outside of the authorised footprint areas.</li> <li>The removed vegetation must be stockpiled outside of the delineated boundary of the wetlands. The footprint areas of these stockpiles should be kept to a minimum. Should the vegetation not be suitable for reinstatement after the construction phase or be alien/invasive vegetation species, all material must be disposed of at a registered garden refuse site and may not be burned or mulched on site.</li> </ul>								
With mitigation	Regional	Medium	Short-term	Low	Probable	Low	– ve	High
	2	2	1	5				

**Table 13-2: Assessment of impacts relating to movement of construction equipment during the construction phase on valley head seep wetland**

	Extent	Intensity	Duration	Consequence	Probability	Significance	Status	Confidence
Without mitigation	Regional	High	Long-term	Very high	Definite	Very high	– ve	High
	2	3	3	8				
Mitigation measures:								
Refer to the mitigation measures provided in Table 13-1.								
With mitigation	Regional	Medium	Medium-term	Medium	Probable	Medium	– ve	High
	2	2	2	6				

### 13.1.2 Construction: Ground-breaking and earthworks

Movement of construction machinery/vehicles within the valley head seep wetland and within the vicinity of the CVB wetland, potential spills and/or leaks from construction vehicles and earthworks (including excavation, infilling and levelling of soil to create a levelled platform, compaction of soil and stockpiling of excess soil) may have the following potential impacts on the wetlands:

- Total loss of 0.089 ha of valley head seep wetland habitat as a result of the proposed main soccer field and terrace within the wetland.
- Disturbances of soil leading to ponding of water as a result of over compaction of soil in some areas, increased alien vegetation proliferation, and in turn altered wetland habitat and runoff patterns.
- Altered runoff patterns, leading to increased erosion and sedimentation of the receiving wetlands.
- Potential erosion and formation of preferential flow paths as a result of disturbed soil and inappropriate slopes resulting in sedimentation of the wetlands.
- Disruption to the embankment, potentially causing sedimentation.
- Ground disturbances and dust pollution during construction which may impact water quality.


The assessment of significance of these potential impacts on the CVB and valley head seep wetlands is provided Table 13-3 and Table 13-4, respectively. Provided the mitigation measures are implemented the potential impacts are fully reversible for the CVB wetland and partially reversible for the valley head seep wetland.

**Table 13-3: Assessment of impacts relating to ground-breaking and earthworks activities during the construction phase on CVB wetland**

	Extent	Intensity	Duration	Consequence	Probability	Significance	Status	Confidence
Without mitigation	Regional	Medium	Medium-term	Medium	Probable	Medium	– ve	High
	2	2	2	6				

**Mitigation measures:**

- Major earthworks near the wetland can be avoided if the proposed main soccer field is slightly levelled as needed and major terracing is avoided.
- Vegetation clearing and movement within the wetlands to be limited to what is absolutely essential. Retain as much indigenous vegetation as possible.
- All vehicles are to remain within existing roads and no new roads should be developed without prior authorisation.
- All stockpiles should not exceed 2m in height and be located at least 10 m from the delineated wetlands. Stockpiling of removed materials may only be temporary (may only be stockpiled during the period of construction at a particular site) and should be disposed of at a registered waste disposal facility.
- All exposed soil, including stockpiles, must be protected for the duration of the construction phase with a suitable geotextile (e.g. Geojute or hessian sheeting) in order to prevent excessive dust generation, erosion and sedimentation of the receiving freshwater environment.
- Given the topography of the site, silt traps (refer to Plate 13-1 for example) should be installed downgradient of the construction works to limit any sediment entering the downgradient wetland areas, especially considering the excavation activities associated with the valley head seep wetland. Sediment traps should allow for surface runoff should a rainfall event occur.



**Plate 13-1: Example of the installation of geotextile sediment traps to be used during the construction phase, to limit additional sediment from entering the downstream portion of the wetlands**

- Concrete and cement-related mortars can be toxic to aquatic life. Proper handling and disposal should minimize or eliminate discharges into freshwater ecosystems. High alkalinity associated with cement, which can dramatically affect and contaminate both soil and ground water. The following recommendations must be adhered to:
  - Fresh concrete and cement mortar should not be mixed within 10 m of the identified wetlands. Mixing of cement may be done within the construction camp, may not be mixed on bare soil, and must be within a lined, bound or banded portable mixer. Consideration must be taken to use ready mix concrete.
  - No mixed concrete shall be deposited directly onto the ground whilst it awaits placing. A batter board or other suitable platform/mixing tray is to be provided onto which any mixed concrete can be deposited whilst it awaits placing.
  - Cement bags must be disposed of in the demarcated hazardous waste receptacles and the used bags must be suitably disposed of.
  - Spilled or excess concrete must be disposed of at a suitable landfill site.
- Only indigenous vegetation species may be used as part of the landscaping of the development, and invasive plant species should be eradicated.

	Extent	Intensity	Duration	Consequence	Probability	Significance	Status	Confidence
With mitigation	Regional	Medium	Short-term	Low	Probable	Low	– ve	High
	2	2	1	5				




**Table 13-4: Assessment of impacts relating to ground-breaking and earthworks activities during the construction phase on valley head seep wetland**

	Extent	Intensity	Duration	Consequence	Probability	Significance	Status	Confidence
Without mitigation	Regional	High	Long-term	Very high	Definite	Very high	– ve	High
	2	3	3	8				

**Mitigation measures:**

- Refer to the mitigation measures in Table 13-3.
- When installing the conservancy tank, double-check regularly to ensure that nothing falls into the tank and no effluent will leak out of the tank.
- In order to create the proposed terrace all vegetation will need to be cleared. All indigenous vegetation can be stockpiled and mulched, to be used as organic matter during the rehabilitation phase. All exotic or alien vegetation must be removed from the watercourse and disposed of at a registered facility.
- As far as feasibly possible, imported material used for infilling and terracing of the proposed project must be free of weeds and alien and invasive vegetation species seeds.
- The first 10 cm of topsoil should be stripped and stockpiled for reuse once the proposed terrace has been shaped and the wetland has been re-sloped.
- The proposed terrace should be designed in such a way that there are no steep slopes which may limit vegetation growth and result in erosion. A maximum slope with 1:4 is considered the most appropriate balance between reducing footprint and ensuring slopes are stable.
- It must be ensured that there is no impedance to stormwater that is released into the valley head seep wetland and that all stormwater is suitably managed.
- The area must be suitably compacted to prevent any erosion or preferential flow paths from occurring.
- No hard infrastructure is allowed within the reshaped area and use of hard engineering structure (such as gabion retention structures or reno-mattresses) should be avoided as far as feasibly possible.
- It is recommended that a post and wire fence be utilised for the proposed fence line. Although clear view fencing is suitable for security as it cannot be easily removed or cut, it does limit the movement of fauna (with only insects and avifaunal species able to navigate it). If clear view is desired a suitable faunal specialist should assist in designing under tunnels for larger faunal species (such as porcupine).
- No formal paving should be used for the proposed walkway. In situ compaction of soil or bark mulch could be utilised (for example see Figure below).
- Revegetation of the areas surrounding the walkways with suitable indigenous species of the Indian Ocean Coastal is recommended.



**Plate 13-2: Example of compacted soil walkway**

	Extent	Intensity	Duration	Consequence	Probability	Significance	Status	Confidence
With mitigation	Regional	Medium	Medium-term	Medium	Probable	Medium	– ve	High
	2	2	2	6				


### 13.1.3 Construction: Installation of water pipeline, irrigation line and sewer line

Excavation and trenching leading to stockpiling of soil and movement of construction equipment and personnel within the wetlands during the installation of the proposed water pipeline within the 32m of the CVB; the proposed irrigation line within the 32 m of the valley head seep wetland; and the proposed sewer line within 40 m of the valley head seep wetland may have the following potential impacts:

- Disturbances of soil leading to disturbance to the wetland vegetation and resulting in increased sediment loads in the downgradient areas.
- Increased alien vegetation proliferation in the footprint areas, and in turn to altered wetland habitat.
- Altered runoff patterns, leading to increased erosion and sedimentation of the wetlands during rainfall events.

The assessment of the significance of these potential impacts on the CVB and valley head seep wetlands is provided in Table 13-5. Provided the mitigation measures are implemented the potential impacts are fully reversible for the CVB and valley head seep wetlands.

**Table 13-5: Assessment of impacts relating to the installation of water pipeline, irrigation line and sewer line during the construction phase on CVB and valley head seep wetlands**

	Extent	Intensity	Duration	Consequence	Probability	Significance	Status	Confidence
Without mitigation	Regional	Medium	Short-term	Low	Probable	Low	– ve	High
	2	2	1	5				
<b>Mitigation measures:</b> With regards to open trenching for the installation of the water pipeline, sewer pipeline, and irrigation line								
<ul style="list-style-type: none"><li>• During trenching, soil may be stockpiled on the upgradient edges of the excavation in order to limit potential sedimentation of the downgradient wetlands (Figure C).</li><li>• Mixture of the lower and upper layers of the excavated soil should be kept to a minimum. The soil must be used to backfill the trenches, immediately after inserting the pipeline; and</li><li>• The stockpiles must remain as small as possible and may not exceed 2m in height.</li></ul>								
								
<b>Plate 13-3: An example of a trench being excavated, and the removed soil stockpiled along the trench</b>								
With mitigation	Regional	Medium	Short-term	Low	Possible	Low	– ve	High
	2	2	1	5				

### 13.1.4 Construction: Stormwater Management

The establishment of stormwater channels and outlet structures are anticipated to have the following potential impacts on the CVB and valley head seep wetlands:

- Alterations to the sediment loads within the wetlands.
- Potential deposition of waste material into the wetlands.
- Potential changes to the water retention pattern of the wetlands.

The assessment of significance of these potential impacts on the CVB and valley head seep wetlands is provided in Table 13-6. Provided the mitigation measures are implemented the potential impacts are fully reversible for the CVB wetland and the valley head seep wetland

**Table 13-6: Assessment of impacts relating to establishment of stormwater channels and outlet structures during the construction phase on the CVB and valley head seep wetlands**

	Extent	Intensity	Duration	Consequence	Probability	Significance	Status	Confidence
Without mitigation	Regional	Medium	Short-term	Low	Probable	Low	– ve	High
	2	2	1	5				
<b>Mitigation measures:</b> <ul style="list-style-type: none"><li>• An adequate stormwater management plan must be incorporated into the design of the proposed project. Stormwater must be released in an attenuated manner outside of the wetlands in line with the suggestions as follows.</li><li>• A suitably qualified freshwater specialist should provide input into this plan.</li><li>• It is strongly recommended that the developer consider Sustainable Drainage Systems (SuDS) for stormwater management (as opposed to underground stormwater pipelines) and that these systems be vegetated with indigenous freshwater vegetation as this will assist with sediment trapping and “polishing” of stormwater before releasing into the wetlands (refer to Plate 13-4)</li></ul>								

- It is further recommended that the developer create a constructed wetland/retention pond for the stormwater to enter so that it is not released directly into the wetlands. This will be a proactive approach to limit contaminated water entering the wetlands.
- Energy dissipating structures should be installed at the stormwater outlets to prevent erosion and scouring of the wetlands where the stormwater will be discharged into.
- At the drop of stormwater outlets, rocks must be placed, and vegetation established to bind the soil of the bed, and to prevent erosion. This will also diffuse flow and lower the velocity of water entering the wetlands.
- Litter traps should be installed at all the inspection chambers to prevent any litter from entering into the freshwater ecosystems.



**Plate 13-4: Examples of open swales, considered to be SuDs utilised for conveyance of stormwater**

	Extent	Intensity	Duration	Consequence	Probability	Significance	Status	Confidence
With mitigation	Regional	Medium	Short-term	Low	Possible	Low	– ve	High
	2	2	1	5				

### 13.1.5 Operational: Small-scale rehabilitation of the area

Small-scale rehabilitation of the valley head seep wetland activities including the re-vegetation of surrounding wetland areas, removal of alien and invasive plants and any obstructions to flow; proactive monitoring to identify early signs of alien vegetation encroachment will have the following potential impacts:

- Soil compaction within the wetlands.
- Potential sedimentation of the valley head seep wetland due to activities within the wetland.
- Impacts to water quality of the wetlands as a result of the application of herbicides.

The assessment of significance of these potential impacts on the CVB and valley head seep wetlands is provided in Table 13-7. Provided the mitigation measures are implemented the potential impacts are fully reversible for the CVB wetland and the valley head seep wetland.

**Table 13-7: Assessment of impacts relating to small-scale rehabilitation during the operational phase on CVB and valley head seep wetlands**

	Extent	Intensity	Duration	Consequence	Probability	Significance	Status	Confidence
Without mitigation	Regional	Medium	Short-term	Low	Probable	Low	– ve	High
	2	2	1	5				

**Mitigation measures:**

- [\*The Wetland Rehabilitation and Management Plan \(WRMP\), including an Alien Invasive Control and Management Plan \(AIPCP\) must be implemented \(refer to Appendix G\).\*](#)
- Following construction, [\*the\*](#) alien invasive management plan must be implemented to ensure that alien invasive plant species do not become established within the areas disturbed by construction activities.
- Rehabilitation of the wetlands must be undertaken, including clearing of all alien and invasive vegetation and reinstatement of indigenous wetland vegetation (particularly for the valley head seep wetland where portions of the proposed main soccer field are proposed).
- It is considered advantageous if the impacted areas adjacent to the wetlands be rehabilitated with indigenous terrestrial vegetation to create an open space corridor and reinstate the ecological buffer to the wetlands.

<ul style="list-style-type: none"> <li>The wetlands must be monitored for alien and invasive vegetation encroachment and all alien vegetation/weeds must be removed according to a suitable alien vegetation control plan. Annual follow up should be undertaken to the wetlands for at least 3 years post construction.</li> <li>Where applicable for the eradication of alien and invasive vegetation, care should be taken with the choice of herbicide to ensure that no additional impact and loss of indigenous plant species occurs due to the herbicide used and water contamination is avoided.</li> </ul>								
	Extent	Intensity	Duration	Consequence	Probability	Significance	Status	Confidence
With mitigation	Regional	Medium	Short-term	Low	Possible	Low	– ve	High
	2	2	1	5				

### 13.1.6 Operational: Operation of the Sports Facility development

Increased impermeable surfaces due to the presence of roofs, parking areas, access roads, etc. and potential indiscriminate movement of vehicles within the freshwater ecosystems for perimeter inspections/ maintenance will result in the following potential impacts:

- Altered runoff patterns and increased water inputs to the receiving wetlands, resulting in altered flow regime.
- Altered flow regime may lead to changes to and impacts on vegetation as a result.
- Proliferation of alien and invasive plant species within the wetlands.

The assessment of significance of these potential impacts on the CVB and valley head seep wetlands is provided Table 13-8. Provided the mitigation measures are implemented the potential impacts are fully reversible for the CVB wetland and the valley head seep wetland.

**Table 13-8: Assessment of impacts relating to operation of the proposed project during the operational phase on CVB and valley head seep wetlands**

	Extent	Intensity	Duration	Consequence	Probability	Significance	Status	Confidence
Without mitigation	Regional	Medium	Short-term	Low	Probable	Low	– ve	High
	2	2	1	5				
<b>Mitigation measures:</b> <ul style="list-style-type: none"><li>• Adequate stormwater run-off measures must be put in place and no stormwater may be directly released into the wetland. Attenuation ponds and/or SuDs must be installed to assist with water “polishing” and reducing the velocity of water before entering the wetlands. This will ensure no erosion or scouring occurs as a result of stormwater inputs.</li><li>• Incorporate as much indigenous terrestrial and wetland vegetation into the open space areas, SuDS, and stormwater attenuation facilities (where applicable) associated with the proposed project.</li><li>• Any spills to be immediately cleaned up and treated accordingly.</li><li>• No vehicles are permitted to enter into the freshwater ecosystems. Any maintenance works must be undertaken by foot or the relevant authorisations obtained beforehand.</li></ul>								
With mitigation	Regional	Medium	Short-term	Low	Possible	Low	– ve	High
	2	2	1	5				

### 13.1.7 Operational: Operation of the proposed water pipeline

Impacts which may result from potential leakage of water from the pipelines include:

- Possible incision and alteration of the hydroperiod of the downgradient wetlands.
- Potential impacts to the water quality of the wetland.

The assessment of significance of these potential impacts on the CVB and valley head seep wetlands is provided in Table 13-9. Provided the mitigation measures are implemented the potential impacts are fully reversible for the CVB wetland and the valley head seep wetland.



**Table 13-9: Assessment of impacts relating to operation of the of the proposed water pipeline on CVB and valley head seep wetlands**

	Extent	Intensity	Duration	Consequence	Probability	Significance	Status	Confidence
Without mitigation	Regional	Medium	Short-term	Low	Probable	Low	– ve	High
	2	2	1	5				
<b>Mitigation measures:</b> <ul style="list-style-type: none"><li>• It is recommended that the integrity of the water pipelines be tested at least once every five years or more often should there be any sign of a leak;</li><li>• It should be ensured that the hydrological regime of the downgradient wetlands not be impacted as a result of leaks or bursting of the pipeline, and that an emergency plan should be compiled to ensure a quick response and attendance to the matter in case of a leakage or bursting of the pipeline;</li><li>• Should repair of the pipeline be required to address a leak, mitigations as per activity 1 to 5 above are applicable depending on the location of the leak</li></ul>								
With mitigation	Regional	Medium	Short-term	Low	Possible	Low	– ve	High
	2	2	1	5				

### 13.1.8 Operational: Operation and maintenance of conservancy tanks and associated infrastructure

The possible indiscriminate movement of waste removal vehicles leading to damage to the conservancy tanks may have the following impacts:

- Potential failure of infrastructure resulting in anaerobic conditions within the conservancy tanks and possible spillage and runoff of sewage from the conservancy tanks into the wetlands decreasing the quality of surface water.
- The anaerobic conditions in the conservancy tank system could lead to a decrease in effluent quality which may enter the wetlands.

The assessment of significance of these potential impacts on the CVB and valley head seep wetlands is provided in Table 13-13. Provided the mitigation measures are implemented the potential impacts are fully reversible for the CVB wetland and the valley head seep wetland.

**Table 13-10: Assessment of impacts relating to operation and maintenance of conservancy tanks and associated infrastructure on CVB and valley head seep wetlands**

	Extent	Intensity	Duration	Consequence	Probability	Significance	Status	Confidence
Without mitigation	Regional	Medium	Short-term	Low	Probable	Low	– ve	High
	2	2	1	5				
<b>Mitigation measures:</b> <ul style="list-style-type: none"><li>Regular monitoring of the conservancy tanks and associated infrastructure must be undertaken to allow for pro-active management, including regular inspection of all conservancy tanks to ensure they do not leak.</li><li>Care must be taken when servicing the conservancy tanks, making sure that no litter or runoff from the servicing of the conservancy tank enters the wetland.</li><li>In the event of that the following warning signs are noticed during regular inspection, contact a professional septic company/preferred installer immediately for assistance:<ul style="list-style-type: none"><li>Surfacing sewerage or wet spots.</li><li>Gurgling sounds in the plumbing system.</li><li>Slow draining fixtures.</li></ul></li></ul>								
With mitigation	Regional	Medium	Short-term	Low	Possible	Low	– ve	High
	2	2	1	5				

### 13.1.9 Operational: Monitoring of the sewer and water pipelines, and operation of the stormwater management system

Proactive monitoring of the sewer and water pipelines, and operation of the stormwater management system to ensure structural integrity is maintained may have the following impacts:

- Compaction of soil and loss of habitat as a result of ongoing disturbance from vehicles and equipment.
- Disturbance of soil which could lead to erosion.

The assessment of significance of these potential impacts on the CVB and valley head seep wetlands is provided in Table 13-11. Provided the mitigation measures are implemented the potential impacts are fully reversible for the CVB wetland and the valley head seep wetland.

**Table 13-11: Assessment of impacts relating to monitoring of the sewer and water pipelines, and operation of the stormwater management system on CVB and valley head seep wetlands**

	Extent	Intensity	Duration	Consequence	Probability	Significance	Status	Confidence
Without mitigation	Regional	Medium	Short-term	Low	Probable	Low	– ve	High
	2	2	1	5				
<b>Mitigation measures:</b> <ul style="list-style-type: none"><li>• All wetlands are to be considered "off limits" to any vehicular activity.</li><li>• Disturbances to the wetlands should be limited to what is essential for long-term maintenance in line with the mitigation measures presented herein.</li><li>• Existing access roads must be used for monitoring purposes. No indiscriminate movement of vehicles is allowed as this would result in the compaction of soil and potential loss of wetland and instream habitat.</li><li>• The likelihood of erosion is reduced due to a higher surface roughness of SuDs (earth swales), allowing for water to enter the wetlands at a lower velocity.</li><li>• The SuDs should be inspected regularly to ensure proper functioning, monitoring of erosion and clearing of any debris or litter in the SuDs.</li><li>• Regular inspection of the stormwater outlet structures should be undertaken to monitor the occurrence of erosion. If erosion has occurred, it should immediately be rehabilitated by means of revegetation.</li><li>• Water will be diverted around the soccer field in earth cut off trenches and stone pitched swales will be used to discharge water into the wetland in an attenuated manner.</li><li>• Hot spots for the build-up of debris and excess sediment within the wetlands must be identified and when necessary, debris/excess sediment must be removed by hand to prevent future flooding and potential damage to infrastructure. In this regard, special mention is made of periods following high rainfall and subsequent high instream water volumes. Removal of debris must be undertaken in line with the above listed construction mitigation measures.</li><li>• Any erosion or gully formation must be identified on an ongoing basis and re-profiled and revegetated accordingly.</li></ul>								
With mitigation	Regional	Medium	Short-term	Low	Possible	Low	– ve	High
	2	2	1	5				

### 13.1.10 Biodiversity and Wetland Offsets

#### a) Mitigation hierarchy

Offsets are applied within a mitigation hierarchy and are only aimed at mitigating or compensating for residual impacts of project development on the environment (often called "compensatory mitigation") after all appropriate and feasible steps have first been taken to avoid/prevent, minimize/reduce and remediate/rehabilitate impacts (Macfarlane *et al.*, 2016).

- First, the proposed project *must* try to avoid or prevent negative impacts on biodiversity and ecosystem services by seeking alternative types of development, or alternative locations, different scales of development, different layouts and siting of development components, etc.
- Secondly if the above-mentioned alternatives have been exhausted, every effort should be made to minimize negative impacts and to rehabilitate or remediate affected areas.
- 'Residual impacts' are what will remain after minimising impacts and rehabilitation. These residual impacts would then need to be compensated for, and this may involve the specific application of an offset.

## b) Implementation of the Mitigation Hierarchy

The mitigation hierarchy has been defined by Macfarlane *et al.* (2016) and necessitates specific steps that first need to be taken to avoid/prevent, minimise/reduce and remediate/rehabilitate impact prior to investigation into any offset initiative. The different pathways investigated for the proposed project are summarised in the points below:

- Step 1: Avoid or prevent negative impacts on biodiversity and ecosystem services  
A consultation process was undertaken between the proponent, engineers and the freshwater specialist prior to this offset plan to optimise the layout in order to avoid the identified wetlands as far as feasibly possible, in line with the minimum project footprint.
- Step 2: Make effort to minimise negative impacts and to rehabilitate or remediate affected areas:  
As part of the proposed layout, and in line with the final layout plan, all unavoidable impacts on the watercourses must be mitigated to minimise the impacts. Although avoidance of the wetland habitat (as indicated in Step 1) was undertaken as far as possible, an anticipated unavoidable loss of 0.089 ha of wetland is still anticipated. Strict mitigation measures have therefore stipulated in the freshwater ecological assessment in order to minimize the impacts as far as possible.

Due to complete avoidance and recreation of wetland HGM units not being a feasible mitigation option, the residual impacts as a result of the proposed project needs to be compensated for and the best alternatives (including onsite rehabilitation of the remaining portions of the wetlands) has therefore been identified as part of this project. From the results of the analyses it is evident that the proposed project will lead to a loss of 0.0305 functional hectare equivalents and 0.0454 conservation target hectare equivalents.

The required ecosystem conservation hectare equivalents equate to 0.429 Hae. This is attributed to the threat status and protection level of the applicable WetVeg group (according to Mbona *et al.*, 2015). As the WetVeg group is considered “critically endangered”, a factor of 1:15 is utilised by the wetland offset calculator tool (Macfarlane *et al.*, 2016). The functional hectare equivalent target is 0.031 functional Hae.

The need and desirability of a wetland offset was considered. Taking into consideration the loss of habitat associated with wetlands within the proposed project, an offset to compensate for loss of habitat will assist in limiting any residual loss of wetland.

Due to the limited extent of the wetland loss and the location of the development a formal offset initiative is not deemed possible, and it is therefore proposed to compensate for the loss by improving the functionality of the remaining wetland extent. The combined functional hectare equivalents and conservation hectare equivalents equates to .4594 ha. This was rounded to 0.5 ha which will be rehabilitated to offset the effects of the wetland to compensate for the wetland impact.

## c) Recommended Rehabilitation Measures for Target Wetlands

Based on the outcomes of the offset analyses, the following preliminary rehabilitation measures have been recommended in order to improve the functionality and ecological integrity of the identified target wetlands:

- Implementation of an alien invasive vegetation plan, to eradicate as far as possible all alien floral species which are identified within wetland areas.
- Re-introduction of indigenous vegetation, in particular, graminoid species and sedges where vegetation is sparse. Manure sourced from local farmers is likely to contain seeds of naturally occurring floral species, and this could be utilised in the rehabilitated areas to further encourage growth of indigenous flora;
- Erosion control within the wetlands and their buffer zones in order to prevent sedimentation, enable natural vegetation to become re-established, and improve water quality. Examples of possible management methods include monitoring of access by domestic livestock, protection of small areas of exposed soils with suitable geotextiles or organic material (e.g., branches) until

such time as vegetation is re-established, appropriate stormwater management practices and installation of erosion berms; and

- Indiscriminate grazing practices and crop cultivation bordering the wetlands are widespread in the surrounding community and are largely responsible for the poor condition of the vegetation communities of the wetlands. Thus, whilst it may not be feasible to prevent grazing of livestock altogether, the local community should be educated about sustainable grazing practices.

## 13.2 Terrestrial Ecological Impacts

The development of the proposed project is located within an urban area, surrounded by housing and road infrastructure. At present, the site is largely utilised as an informal soccer field and recreation area, whilst the peripheral areas are also used for grazing of cattle. The site comprises of two wetland systems (refer to Section 4.4), located in the eastern and western portions of the site. The proposed Sports Facility and associated infrastructure will partially impact upon the wetland system in the east of the study area. Although this wetland, from a faunal, floral and terrestrial sensitivity perspective is not considered important or sensitive, it is important that all activities within this wetland are managed in accordance with the mitigation measures discussed in Section 13.1.

The remaining grassland areas interspersed with woody species in the study area is not considered sensitive and has over the years been disturbed. This disturbance and the continued use of the area by the community has resulted in the species composition not being considered representative of the reference vegetation type, KwaZulu Natal Coastal Belt Thornveld (Mucina and Rutherford, 2006). It is evident that the vegetation and plant species composition within the proposed development site corroborates that of the national web-based environmental screening tools “low plant sensitivity theme”. In addition to this, the continued anthropogenic activities within the site, and lack of ecological management and AIP proliferation will likely result in further habitat disturbance and degradation.

The faunal composition within the study area is not anticipated to be of significant conservation value due the lack of habitat connectivity, degraded habitat and past and current anthropogenic activities. Following the site assessment, it is evident that the site, indicated as a medium sensitivity zone as per the national web-based environmental screening tool, is unlikely to support the trigger species due to the lack of suitable habitat and increased presence of people within the site. As such, the study area should rather be associated with a low animal sensitivity.

Following the desktop and site assessment it is expected that the impacts on the receiving environment resulting from the proposed activities are anticipated to be low, provided they are suitably managed and that all mitigation measures as per the freshwater report (SAS 220143) are implemented. Furthermore, it is recommended that as part of the development all AIP species are properly controlled and that a landscaping and revegetation plan be developed for the surrounding and disturbed areas.

## 13.3 Traffic Impact

It was noted in the TIA that the area is situated in what is classified as a Low Vehicle Ownership Area and as such the majority of patrons utilising these sport fields will either be pedestrians or will utilise public transport. In addition, the following points are noted:

- The road network surrounding the proposed development operates as public transport routes.
- There is a significant amount of public transport vehicles that service the area.
- There is adequate parking within the sport fields for taxis to park.
- All roads surrounding the proposed development have adequate sidewalks.

It was therefore determined that if recommendations noted in Section 10.4 are adhered to, the impacts post development will operate under acceptable conditions.



### 13.4 **Socio-economic Impacts**

The socio-economic environment may be described as that part of the environment which has its origin or being in human activities i.e. social, economic, cultural and political objects and processes (DEAT, 1992). Due to the nature of the proposed development (i.e. formalisation of a sports facility on a relatively transformed piece of land with no heritage resources identified) no significant socio-economic impacts were identified and assessed. The proposed development will, however, have several potential impacts that include:

- Construction phase:
  - Improved quality of life through temporary employment opportunities.
  - Noise pollution from construction activities.
  - Deterioration in air quality from dust that may be created through the construction process and fires on-site.
  - Heritage resource disturbance during earth moving activities.
- Operational phase:
  - Provision of a formalised sporting facility for the community.

General Duty of Care outcomes have been included in Section 5 of the EMPr to address these impacts (refer to **Appendix E**).

### 13.5 **Cumulative Impacts**

Cumulative impacts are activities and their associated impacts on the past, present and foreseeable future, both spatially and temporally, considered together with the impacts identified in Section 13 above. Wetlands within the region are under continued threat due to growing urbanisation in the surrounding landscape.

Direct and indirect impacts identified within urban freshwater ecosystems bordering agricultural/rural and urban development include an increase in alien and invasive species entering the system due to regular disturbance of soil and removal of indigenous vegetation. This results in greater inputs of sediment, and nutrients from runoff that are of higher concentrations in agricultural runoff. The proposed project will contribute to the increased hardened surfaces in the catchment, resulting in more stormwater influxes to the receiving wetlands which are currently impacted by stormwater infixes. The impacts on the reach of the valley head seep wetland to be traversed by the proposed project are likely to add to the cumulative effect on the loss of wetland habitat within the region. However, through rehabilitation efforts such as long-term alien invasive vegetation management, reinstatement of indigenous vegetation, and stormwater management will assist in the positive cumulative impacts on the wetlands.

### 13.6 **Summary of Aspects and Impacts**

A summary of the aspects identified as a result of the listed activities, and the associated potential impacts assessed in this BA Report is provided in Table 13-12.

**Table 13-12: Summary of aspects and associated potential impacts**

<b>Aspect</b>	<b>Listed Activity</b>	<b>Potential Impacts</b>
<b>Construction Phase</b>		
<b>1) <u>Site preparation prior to construction activities:</u></b> a) <u>Movement of construction equipment within channelled valley-bottom (CVB) and valley head seep wetlands.</u>	<u>Activity 12 and Activity 19 of LN1</u>	i. <u>Loss of wetland vegetation and associated habitat and ecosystem services associated with the proposed water pipelines.</u> ii. <u>Indiscriminate movement of construction equipment through the wetlands.</u> iii. <u>Transportation of construction materials can result in disturbances to soil and increased risk of sedimentation and/or erosion.</u> iv. <u>Soil and stormwater contamination from oils and hydrocarbons originating from construction vehicles.</u>
b) <u>Removal of vegetation and associated disturbances to the soil, especially the potential clearance of vegetation within the wetland habitat of the valley head seep wetland for the construction of the proposed main soccer field.</u>	<u>Activity 27 of LN1</u>	v. <u>Loss of freshwater habitat and ecological structure, particularly along the western portion of the valley head seep wetland associated with the proposed main soccer field.</u> vi. <u>Exposure of soil, leading to increased runoff and erosion, and thus increased sedimentation of the wetlands.</u> vii. <u>Increased sedimentation of the wetlands, leading to smothering of vegetation in the downstream reaches.</u> viii. <u>Proliferation of alien and/or invasive vegetation as a result of disturbances.</u>
<b>2) <u>Ground-breaking and earthworks:</u></b> <u>Movement of construction machinery/ vehicles within the valley head seep wetland and within the vicinity of the CVB wetland, potential spills and/or leaks from construction vehicles and earthworks (including excavation, infilling and levelling of soil to create a levelled platform, compaction of soil and stockpiling of excess soil).</u>	<u>Activity 12 and Activity 19 of LN1</u>	i. <u>Total loss of 0.089 ha of valley head seep wetland habitat as a result of the proposed main soccer field and terrace within the wetland.</u> ii. <u>Disturbances of soil leading to ponding of water as a result of over compaction of soil in some areas, increased alien vegetation proliferation, and in turn altered wetland habitat and runoff patterns.</u> iii. <u>Altered runoff patterns, leading to increased erosion and sedimentation of the receiving wetlands.</u> iv. <u>Potential erosion and formation of preferential flow paths as a result of disturbed soil and inappropriate slopes resulting in sedimentation of the wetlands.</u> v. <u>Disruption to the embankment, potentially causing sedimentation.</u> vi. <u>Ground disturbances and dust pollution during construction which may impact water quality.</u>
<b>3) <u>Installation of water pipeline, irrigation line and sewer line:</u></b> <u>Excavation and trenching leading to stockpiling of soil and movement of construction equipment and personnel within the wetlands during the installation of the proposed water pipeline within the 32m of the CVB; the proposed irrigation line within the 32 m of the valley head seep wetland; and the proposed sewer line within 40 m of the valley head seep wetland.</u>	<u>Activity 12 and Activity 19 of LN1</u>	i. <u>Disturbances of soil leading to disturbance to the wetland vegetation and resulting in increased sediment loads in the downgradient areas.</u> ii. <u>Increased alien vegetation proliferation in the footprint areas, and in turn to altered wetland habitat.</u> iii. <u>Altered runoff patterns, leading to increased erosion and sedimentation of the wetlands during rainfall events.</u>

<b>4) <u>Stormwater Management:</u></b> <u>The establishment of stormwater channels and outlet structures</u>	<u>Activity 12 and Activity 19 of LN1</u>	<ul style="list-style-type: none"> <li>i. <u>Alterations to the sediment loads within the wetlands.</u></li> <li>ii. <u>Potential deposition of waste material into the wetlands.</u></li> <li>iii. <u>Potential changes to the water retention pattern of the wetlands.</u></li> </ul>
<b><u>Operational Phase</u></b>		
<b>1) <u>Small-scale rehabilitation of the area:</u></b> <u>Small-scale rehabilitation of the valley head seep wetland activities, including the re-vegetation of surrounding wetland areas, removal of alien and invasive plants and any obstructions to flow; proactive monitoring to identify early signs of alien vegetation encroachment</u>	<u>Activity 19 of LN1</u>	<ul style="list-style-type: none"> <li>i. <u>Soil compaction within the wetlands.</u></li> <li>ii. <u>Potential sedimentation of the valley head seep wetland due to activities within the wetland.</u></li> <li>iii. <u>Impacts to water quality of the wetlands as a result of the application of herbicides.</u></li> </ul>
<b>2) <u>Operation of the Sports Facility:</u></b> <u>Increased impermeable surfaces due to the presence of roofs, parking areas, access roads, etc. and potential indiscriminate movement of vehicles within the freshwater ecosystems for perimeter inspections/ maintenance</u>	<u>Activity 27 of LN1</u>	<ul style="list-style-type: none"> <li>i. <u>Altered runoff patterns and increased water inputs to the receiving wetlands, resulting in altered flow regime.</u></li> <li>ii. <u>Altered flow regime may lead to changes to and impacts on vegetation as a result.</u></li> <li>iii. <u>Proliferation of alien and invasive plant species within the wetlands.</u></li> </ul>
<b>3) <u>Operation of the proposed water pipeline:</u></b> <u>Potential leakage of water from the pipelines</u>	<u>Activity 19 of LN1</u>	<ul style="list-style-type: none"> <li>i. <u>Possible incision and alteration of the hydroperiod of the downgradient wetlands.</u></li> <li>ii. <u>Potential impacts to the water quality of the wetland.</u></li> </ul>
<b>4) <u>Operation and maintenance of conservancy tanks and associated infrastructure:</u></b> <u>Possible indiscriminate movement of waste removal vehicles leading to damage to the conservancy tanks</u>	<u>Activity 27 of LN1</u>	<ul style="list-style-type: none"> <li>i. <u>Potential failure of infrastructure resulting in anaerobic conditions within the conservancy tanks and possible spillage and runoff of sewage from the conservancy tanks into the wetlands decreasing the quality of surface water.</u></li> <li>ii. <u>The anaerobic conditions in the conservancy tank system could lead to a decrease in effluent quality which may enter the wetlands.</u></li> </ul>
<b>5) <u>Monitoring of the sewer and water pipelines, and operation of the stormwater management system:</u></b> <u>Proactive monitoring of the sewer and water pipelines, and operation of the stormwater management system to ensure structural integrity is maintained</u>	<u>Activity 27 of LN1</u>	<ul style="list-style-type: none"> <li>i. <u>Compaction of soil and loss of habitat as a result of ongoing disturbance from vehicles and equipment.</u></li> <li>ii. <u>Disturbance of soil which could lead to erosion.</u></li> </ul>

## 14 Environmental Management Programme

An EMPr has been prepared for the construction and operational phases of the proposed development, in accordance with the requirements in Appendix 4 of GN 326, and is included in **Appendix E**. The EMPr specifies the methods and procedures for managing the environmental aspects of the proposed development, as informed by the specialist studies and good practice. Monitoring requirements are also stipulated. The EMPr must be implemented (along with the requirements of the Environmental Authorisation) and auditing is to be undertaken on a regular basis to ensure compliance with the EMPr.

## 15 Environmental Impact Statement

A sensitivity map is included as Figure 15-1. This map superimposes the proposed development area onto sensitivity areas. The proposed project is not within a sensitive area.

In addition, the DFFE screening tool was utilised to determine whether there were any sensitive areas, a report was generated and has been included in **Appendix F**. The DFFE screening report identified several specialist studies to be considered. It must be noted that the screening tool is a desktop tool used to identify specialist investigations and is indicative only and requires verification via a site visit. Table 15-1 below lists the specialist studies identified and comments by the EAP. These comments were discussed and agreed upon with EDTEA during the pre-application meeting.

**Table 15-1: DFFE Screening tool – identified specialist studies**

Specialist Study	EAP Recommendations
Landscape/ visual impact assessment	This assessment is not deemed necessary as the site is already utilized for recreational purposes. The proposed project will formalise the facility and it is anticipated that the project will enhance the site visually.
Archaeological and Cultural Heritage Impact Assessment	This assessment was not deemed necessary. A preliminary site review determined that the existing building on site was constructed between 2010 & 2011 (not older than 60 years as required by Section 34(1) of the National Heritage Resources Act). Moreover, the site is classified as having a low archaeological and cultural heritage sensitivity.
Palaeontology Impact Assessment	This assessment was not deemed necessary. The site is currently utilised as a Sports Facility and has therefore been disturbed. Moreover, the site is classified as having a medium palaeontological sensitivity. Chance-find protocols have been included in the EMPr should any artefacts of paleontological importance be unearthed during the construction phase.
Terrestrial Biodiversity Impact Assessment	A specialist investigation was undertaken. Refer to Section 10.3.
Aquatic Biodiversity Impact Assessment	A specialist study was commissioned to define the ecology of the freshwater ecosystem associated with the proposed project in terms of the freshwater ecosystem characteristics, including mapping of the freshwater ecosystems, defining areas of increased Ecological Importance and Sensitivity (EIS), and defining the Present Ecological State (PES) of the freshwater ecosystems associated with the proposed development.
Hydrology Assessment	Not deemed necessary as the hydrology of the site has been taken into account in the stormwater diversion measures of the preliminary design.
Socio-economic assessment	Not deemed necessary as this is a recreational facility which does not seek to generate profit which would impacts socioeconomics in the area impact (other than minor job creation).
Plant and animal species assessments	Not deemed necessary as the project site is in the centre of an existing semi urban community, it is less than 300m from a school and is already used as a Sports Facility. Given the significant disturbance, encroachment on indigenous animal or plant species is considered highly unlikely.

Although SRK is not an elected entity mandated to make decisions on behalf of society, we hereby provide a qualified opinion. In this regard, SRK is of the opinion that this Draft BA Report, EMPr and the attached specialist reports comply with the relevant guidelines and contain all the information required in terms of GN 326 to enable EDTEA to take a decision.



The fundamental decision is whether to allow a development that brings economic and operational benefits. In this case, identified potential negative impacts arising from the proposed [project](#) can be managed to remain within acceptable environmental limits so long as measures set out in the EMPr are implemented.

It is recommended that the following conditions are included in the environmental authorisation:

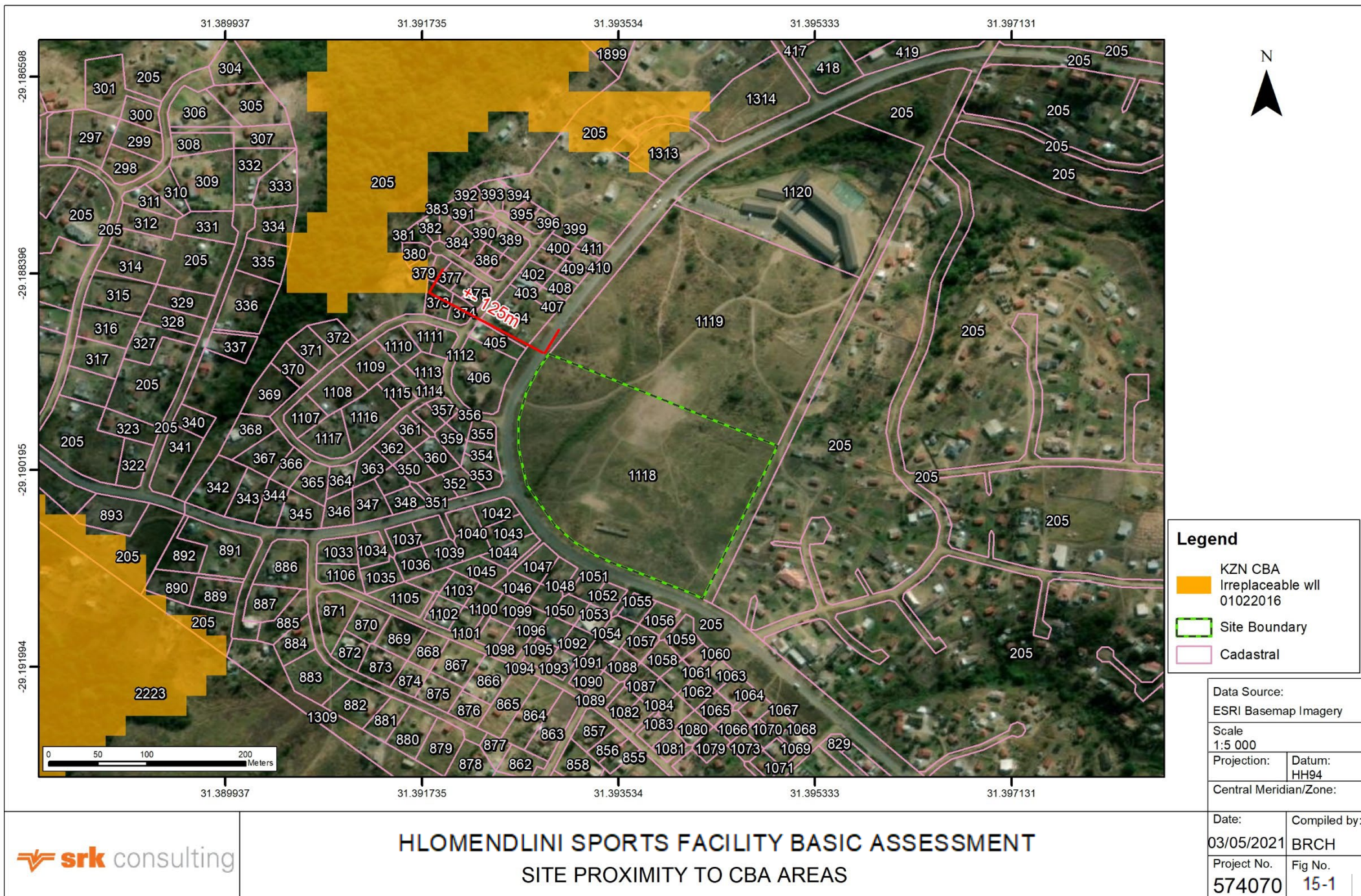
- The mitigation measures provided in Section 13 must be implemented.
- The EMPr should be approved by EDTEA and conditions thereof must be implemented (refer to **Appendix E**).
- An independent Environmental Control Officer (ECO) [must](#) be appointed to provide environmental training to the construction team prior to the commencement of construction.
- The independent ECO [must](#) undertake a pre-construction audit, regular construction audits and a post-construction audit in terms of the EMPr (refer to **Appendix E**).

***SRK believes that this report and the specialist input confirmed that Mandeni Municipality's preferred option is acceptable.***

***The EMPr stipulates the mitigation measures identified that will mitigate the potential impacts identified to within acceptable limits.***

***In conclusion, SRK is of the opinion that the application, as it is currently articulated in this BA Report, should be approved.***

***This statement is conditional on implementation of the mitigation measures stipulated in the EMPr.***





## 16 Assumptions and Limitations

As is standard practice, the report is based on a number of assumptions and is subject to certain limitations. These are as follows:

- Information provided by Mandeni Municipality is assumed to be accurate and correct.
- SRK's assessment of the significance of impacts of the proposed development on the affected environment has assumed that the activities will be confined to those described in Chapter 5. If there are any substantial changes to the project description, impacts may need to be re-assessed.
- It is assumed that the public participation process undertaken during the BA process [has](#) identified all relevant concerns of potentially interested and affected parties.
- Mandeni Municipality will in good faith implement the agreed mitigation measures identified in this report and the attached EMP. To this end, it is assumed that Mandeni Municipality will commit sufficient resources and employ suitably qualified personnel. Notwithstanding the above, SRK is confident that these assumptions and limitations do not compromise the overall findings of the report.
- According to the DWS Risk Assessment Matrix guidelines, for sensitivity ratings within the Moderate Risk range (56-80) a manual adjustment can be made to allow for a low risk. This is to be done subject to the listing of additional mitigation. This manual adjustment was applied by the ecologist in order to classify the proposed maintenance activities as low risk. It is important to note, however, that should all mitigations measures not be adhered to, the risk significance will likely be a medium. The majority of the impacts are considered fully reversible, except those associated with loss of wetland vegetation of the valley head seep wetland that will be traversed by the proposed project. Indirect impacts may arise from potential water quality concerns and increased sediment loads entering the wetlands through the stormwater channels. Considering the socio-economic benefit of the proposed sports development and development footprint thereof relative to the assessed wetland, a manual amendment of the risk significance scoring was implemented to classify these activities as Low risk. The following rationale was used to support this amendment:
  - If the proposed activities are undertaken during the drier summer months, impacts to the hydrological and geomorphological regimes of the wetlands can be considered 'Low'.
  - In order to ensure a 'Low' risk significance, heavy earthworks within the wetlands, particularly for the construction of the proposed main soccer field within portions of the valley head seep wetland, and concrete works must be carefully controlled, and major terracing is avoided.
  - All footprint areas must immediately be revegetated after the construction activities are completed. This will ensure fast recovery of the wetlands post construction activities.
  - Small-scale rehabilitation, including revegetation with indigenous wetland vegetation and control of AIP vegetation is strongly recommended for the valley head seep wetland specifically, and the CVB wetland in general. The long-term impact of rehabilitation activities is considered positive since this will ensure that the ecological service provision of the wetlands is maintained and where feasible, improved.
  - It is also strongly recommended that the proponent makes provision for a stormwater management plan to service the proposed project. Careful planning of the stormwater management plan that will ensure that stormwater is released in an attenuated manner outside of the wetlands, is imperative to ensure the hydraulic regime of the receiving wetlands is retained.
  - While the proposed project plans to make use of septic tanks to service the Sports Facility, given the relatively close proximity of the septic tank and soakaway system and location upgradient of the valley head seep wetland (approximately 40 m from the wetland), it is strongly advised that the use of septic tanks be reconsidered as they pose a risk to contamination of water within the adjacent wetlands and an on-site waste water package plant or conservancy tanks be used instead.
- It is assumed that Mandeni Municipality will apply for a Water Use Licence, as this process is excluded from this submission under NEMA and reliant on NEMA authorisation.
- [A method statement is included in Appendix H of this Final BA Report. The Engineer has, however, noted that the contractor will only be appointed after the Environmental Authorisation is received, assuming such. The contractor may require an amendment to the method statement. Should this](#)

be required, the amended method statement will be submitted to the EDTEA for approval prior to commencement of construction.

**Prepared by**

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Murray Sim  
Partner

All data used as source material plus the text, tables, figures, and attachments of this document have been reviewed and prepared in accordance with generally accepted professional engineering and environmental practices.



## Appendices

## **Appendix A: EAP Declaration**

## **Appendix B: EAP CV**

## **Appendix C: Specialist Studies**



## **Appendix C-1: Freshwater Ecological Assessment**

## **Appendix C-2: Hydropedological Opinion**

## **Appendix C-3: Terrestrial Assessment**

## **Appendix C-4: Geotechnical Investigation**



## **Appendix C-5: Traffic Impact Assessment**

## **Appendix D: Public Participation**

## **Appendix D-1: Minutes of Pre-application Meeting**

## Appendix D-2: I&AP Database



## **Appendix D-3: Advertisement**

## **Appendix D-4: Background Information Document**

## **Appendix D-5: Site Notices**

## **Appendix D-6: Proof of Draft Basic Assessment Report Circulation**

## **Appendix D-7: Comments Received from Circulation of the Draft Basic Assessment Report**



## Appendix E: EMPr

## **Appendix F: DFFE Screening Report**

## **Appendix G: Rehabilitation Plan and Alien Invasive Vegetation Programme**

## **Appendix H: Method Statement for Excavation / Infilling Works in the Wetland**

## SRK Report Distribution Record

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